

Construction *Methods*

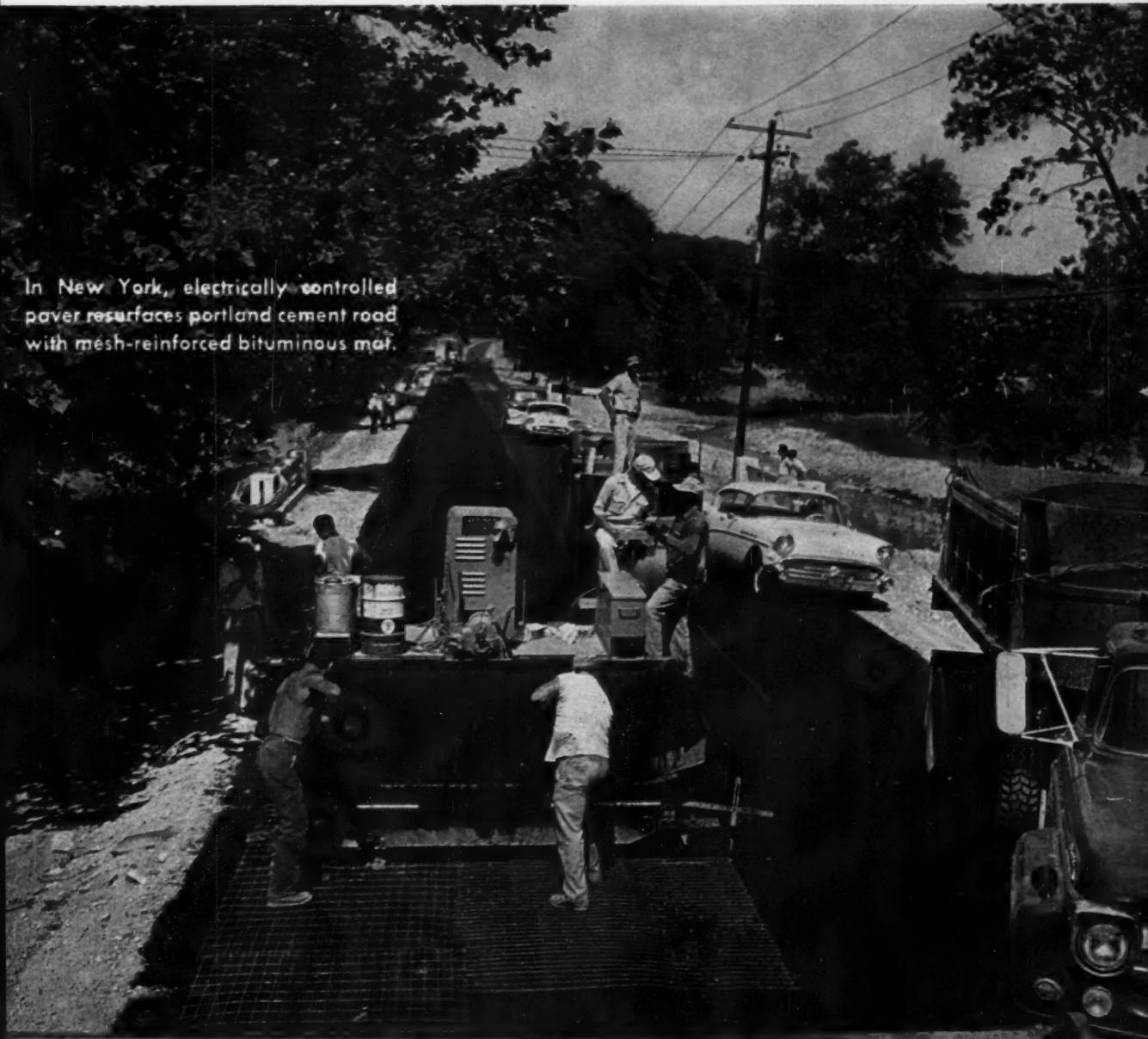
AND
EQUIPMENT

SEPTEMBER, 1960

PRICE \$1.00

A M C G R A W - H I L L P U B L I C A T I O N

In New York, electrically controlled paver resurfaces portland cement road with mesh-reinforced bituminous mat.



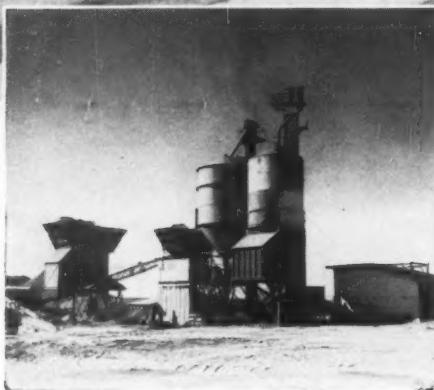
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NEW and USEFUL... a special readers' service, see page 237



"Our improved control with POZZOLITH cuts costs on the Eglin Air Force Base job"

W. J. NOONAN, SR.,
President, Noonan Construction Co.,
Pensacola, Florida



DRY-BATCH PLANT located on the Gulf—approximately 9 miles from the job site. Most aggregates were delivered by barge from Radcliffe Gravel Co., Inc. of Mobile, Alabama. Ideal Cement was also transported to the batch plant by this method.

THIS CONTRACT at Eglin Air Force Base involved the placing of 110,000 cubic yards of unreinforced concrete. Pavement ranged from 14" to 22" thickness. Supervising the job is W. J. Noonan, Jr., General Manager, Noonan Construction Co. • Curtis Sullens, Concrete Supervisor, Corps of Engineers, Mobile District • John Day, Project Superintendent, Noonan Construction Co.

"Corps of Engineers specifications called for 650 psi flexural strength with $4\frac{1}{4}\%$ $\pm 1\frac{1}{4}\%$ entrained air. We knew that with local materials and good control, a plain mix with a cement factor of about 6 sacks per cubic yard should produce this strength.

"We also knew that with POZZOLITH we could meet this flexural specification with 5 to 5.2 sacks and that POZZOLITH would provide close control of entrained air, as well as lower finishing costs. So we based our bid on using POZZOLITH.

"The job was started with a POZZOLITH mix having a cement factor of 5.8 sacks. Because of uniform strength results, well above specification, it was gradually reduced to the 5.2 sack factor which we used in our original estimates. The uniformity in batches, absence of bleeding, and exceptionally good workability kept finishing costs down. Air content was easily maintained at $3\frac{1}{2}\%$ with minor adjustments being made quickly in the field.

"The Master Builders field man worked with us from start to finish giving us the benefit of his experience. This resulted in better quality concrete at lower cost to the owner and substantial savings to us."

For lowest cost-in-place . . . superior quality concrete—there's no equal to today's POZZOLITH. Call in the local Master Builders man to demonstrate how POZZOLITH can help put you ahead on your very next job.

*The Master Builders Company
Division of American-Marietta Co.
Cleveland, Ohio*

World-wide manufacturing and service facilities

MASTER BUILDERS® POZZOLITH®*

*POZZOLITH is a registered trademark of The Master Builders Co. for its concrete admixture to reduce water and control entrainment of air and rate of hardening.

B.F.Goodrich



Curtiss-Wright CW-226 with Hi-Torque brakes carries heavy loads, averaging 90,000 pounds of earth.

Contractor gets trouble-free performance with Hi-Torque brakes on rough, hilly terrain

Completely dependable brake performance, with high stopping power always available, has been reported by Talbott Construction Company, Winchester, Ky. Talbott operates several Curtiss-Wright earthmovers with B.F.Goodrich Hi-Torque brakes.

On one project, the machines were in operation on rough, hilly terrain over a six months period, ten hours a day, six days a week. No adjustments, replacements, or maintenance of any kind was required. Dust and water are effectively sealed out, so the environment presented no ill effects. Automatic adjusters maintain proper clearance, adjust for lining wear.

B.F.Goodrich Hi-Torque brakes cut stopping distance approximately in half, compared to conventional two-shoe brakes. These brakes are now available on heavy dump trucks, tractor-scrapers, coal haulers, mine trucks, and other heavy off-highway vehicles, from several manufacturers. For information ask your equipment maker, or write *B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Department CM-9, Troy, Ohio.*



Hi-Torque brakes permit safe operation on faster cycles.

B.F.Goodrich Hi-Torque brakes

492 Ft. Culvert

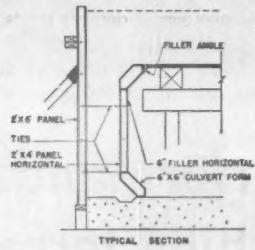


Symons Prefab Forms and Engineering Service

... Reduced by About 1/2 Material Needed for Job

How to extend an existing culvert 492 feet to allow Mercer Slough to pass under the new Seattle by-pass of U.S. Highway 99. Also, how to finish it before rains swell the slough, or creek, to over-flowing. That was the problem faced by A. R. Anderson Construction Company, Seattle.

Anderson used Symons Culvert Forms with Symons Steel-Ply Panels. Symons engineering and their Seattle man, Hal Caffee, designed a form lay-



out, so that inside wall and fillet forms could be stripped out without disturbing the shoring for the slab roof. This not only saved time but reduced by almost one-half, the material needed for the job.

The pay-off! It is estimated that it took under 200 man hours to set up and pour the job and under 60 man hours to strip the forms.

For the complete story on the *Seattle Culvert Job*, send in request on your company letterhead. Symons Steel-Ply Forms rented with purchase option.

Symons

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4255 Diversey Ave., Dept. J-0, Chicago 39, Ill.
Warehouses Thruout the U.S.A.

MORE SAVINGS FROM SYMONS

Circle 2 on Reader Service Card

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Construction Methods AND EQUIPMENT

SEPTEMBER, 1960

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Why Big Pioneer Batch Plant lets you submit lower bids

(and make more profit, too!)

Fully automatic controls with an interlocking timer give this new PIONEER AUTO-batch* bituminous plant up to 15% greater output per day than any other similarly rated plant you can buy!

More batches a day

This is because instant-acting twin gates discharge the 6000 to 7500 lb. batch in as little as 3 seconds, thus permitting this new all-electric plant to deliver many more batches a day than ever before possible...and with less segregation.

If you wish, you may quickly change the plant to "semi-automatic" and still enjoy the benefits of automatic timing for dry and wet mixing cycles. In this case, other sequences

(weighing of material, etc.) are manually controlled. The plant can also be changed back to fully-automatic without difficulty.

You may also set your Auto-batch plant for 2 different mixes, then switch from one to the other with no loss of time.

Another time-saving innovation is the built-in power operated sampling device which makes it easy to take accurate samples of all aggregates at the same time.

Hot-bin gates, weigh hopper gate, pugmill discharge gate, asphalt bucket, as well as asphalt fill and discharge valves are all controlled by instant-acting air cylinders. These cylinders, in turn, are actuated by electric solenoids.

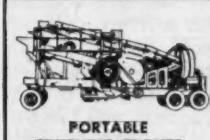
OTHER MEMBERS OF THE PIONEER BITUMINOUS TEAM



PIONEER Continuous Mix Plant



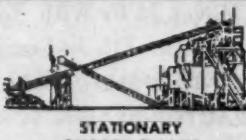
PIONEER VIBROmatic Bituminous Paver



PORTABLE
CRUSHING PLANTS



WASHING
PLANTS



STATIONARY
QUARRY PLANTS



BITUMINOUS
MIXING PLANTS



BITUMINOUS
PAVERS

The PIONEER AUTO-batch plant consists of two semi-portable units. The Drier Unit includes multiclone dust collector (most efficient of all mechanical types) mounted together with the drier on a single chassis.

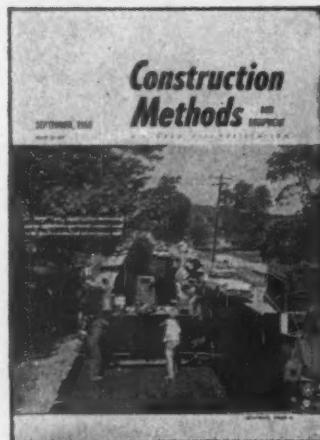
The Tower Unit is of unitized construction to permit easy stacking assembly. The separate screening, weighing, and mixing sections are assembled at the factory as complete, integrated units including wiring and piping. Each of these units can be low-boy loaded... or weighing and mixing units can be fitted with wheels for fifth-wheel towing.

If your future plans call for bituminous work, it will pay you to learn how the new Auto-batch plant will enable you to submit lower bids... and at the same time, help you make a nice profit.

*TRADE MARK

Pioneer® EQUIPMENT

Manufactured by Pioneer Engineering, Division of Poor & Company, Inc., Minneapolis, Minnesota



ON THE COVER

On a resurfacing job near Poughkeepsie, N. Y., a Cedarapids paver rides over sheets of reinforcing fabric as it lays a 1½-in. binder course of asphaltic concrete. A sled made up of 3-in. beams slides along underneath the paver and holds down the mesh, keeping it from getting tangled in the conveyor screw of the paver. A throttle hooked to the engine of the paver permits the operator to change speeds evenly when starting and stopping and keeps the paver from silding on the fabric. For details, see story on page 100.

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NEXT MONTH

Tunneling through the hard trap rock of the Palisades to make way for the New Jersey approaches to the new lower deck of the George Washington Bridge calls for precision blasting. Specs limit tolerance in line drilling to 3 in. But the biggest headache facing the contractor is keeping six lanes of traffic flowing through the congested area while the cut-and-cover operation is underway.

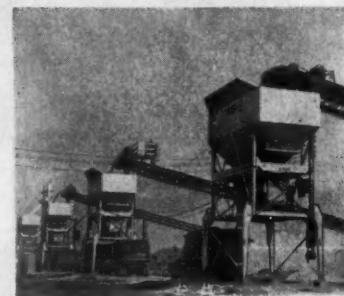
Photo Credits—57 The San Francisco Examiner, 81 (middle) Landesbildstelle Berlin.

SEPTEMBER, 1960

Pay Dirt in This Issue

Modern Batch Plant Keeps Pavers Rolling... 92

Four automatic batchers in this modern plant each weigh and dump ingredients for four batches at a clip to keep four pavers busy extending a runway at Chicago's O'Hare Field.



Common Trench Makes Sense on Sewer Job... 118

Unorthodox procedures pay off on the construction of three parallel sewer lines. The contractor is digging one trench instead of three, and pre-boring for soldier piles.



Foundation Crews Fight Water, Lack of Space... 142

Novel techniques are used to sink caissons 96 ft. through sand, clay, and water. The foundation will support 22 stories to be added to an existing four-floor structure.



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SELF-PROPELLED SCRAPERS

TRACTOR-DRAWN SCRAPERS

PORTABLE COMPRESSORS

GORMAN-RUPP CONTRACTORS PUMPS



A battery of five Gorman-Rupp 90-M Pumps discharge into manifold, while a sixth, equipped with trash head, takes suction on a sanitary sewer line, discharging into stream. Dike in foreground.

1,000 hours at full throttle . . . no time out

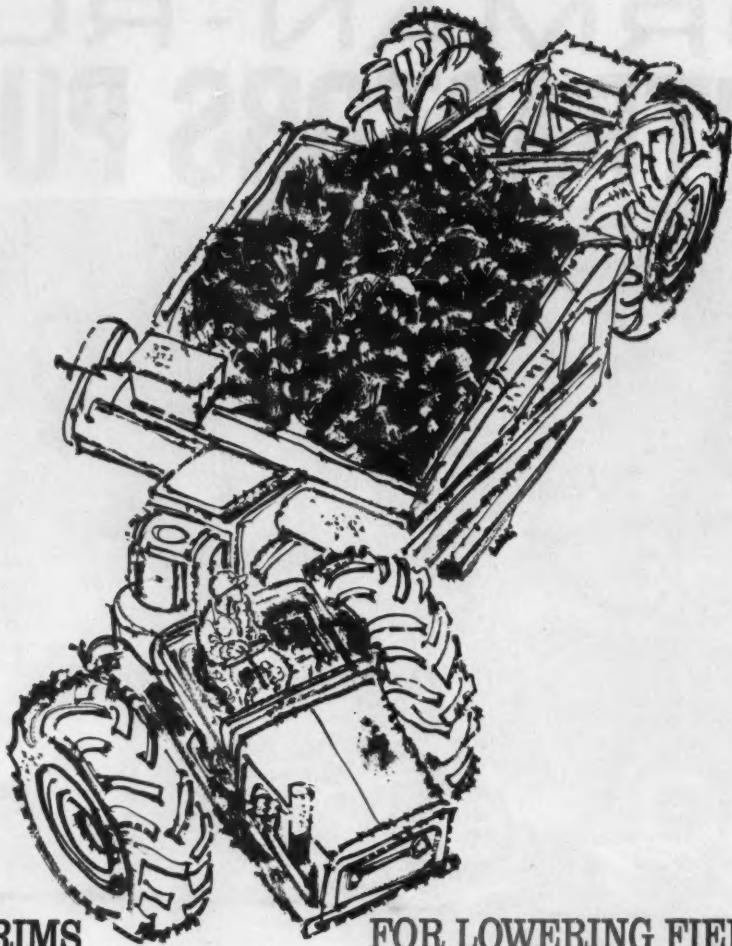
How to dewater completely a stream flowing at considerably more than 400,000 GPH was the major problem for this contractor. The job was a sewer line installation at Mile Run Creek in New Brunswick, N. J. The surprisingly novel answer was to manifold five 6" pumps and work them at full tilt day and night. The pumps were Gorman-Rupp Model 16A2-IND30. The results: Six solid weeks of maximum performance with no pump off the line for more than a

few minutes maintenance, except one which was pumping again in less than three hours. When your needs are the most demanding, the best equipment is none too good. See Gorman-Rupp Pumps for Contractors at your nearby distributor.

THE GORMAN-RUPP COMPANY

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FOR LOWERING FIELD COSTS!

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Firestone Perma-Tite rims are proved the world's strongest! Designed for uniform strength distribution, they have no high stress points to cause failures. Their Perma-Tite design insures a permanent air seal—the greater the pressure, the tighter the seal. Fusion welding in Firestone's exclusive, balanced weld design gives equal penetration for maximum strength. They're protected against corrosion and are interchangeable with all earthmover rims and parts. For any information or aid in adapting Firestone Perma-Tite rims to present or new equipment, write, wire or call Firestone Technic-Service, Dept. 28-5, Firestone Steel Products Co., Akron 1, Ohio.

Firestone

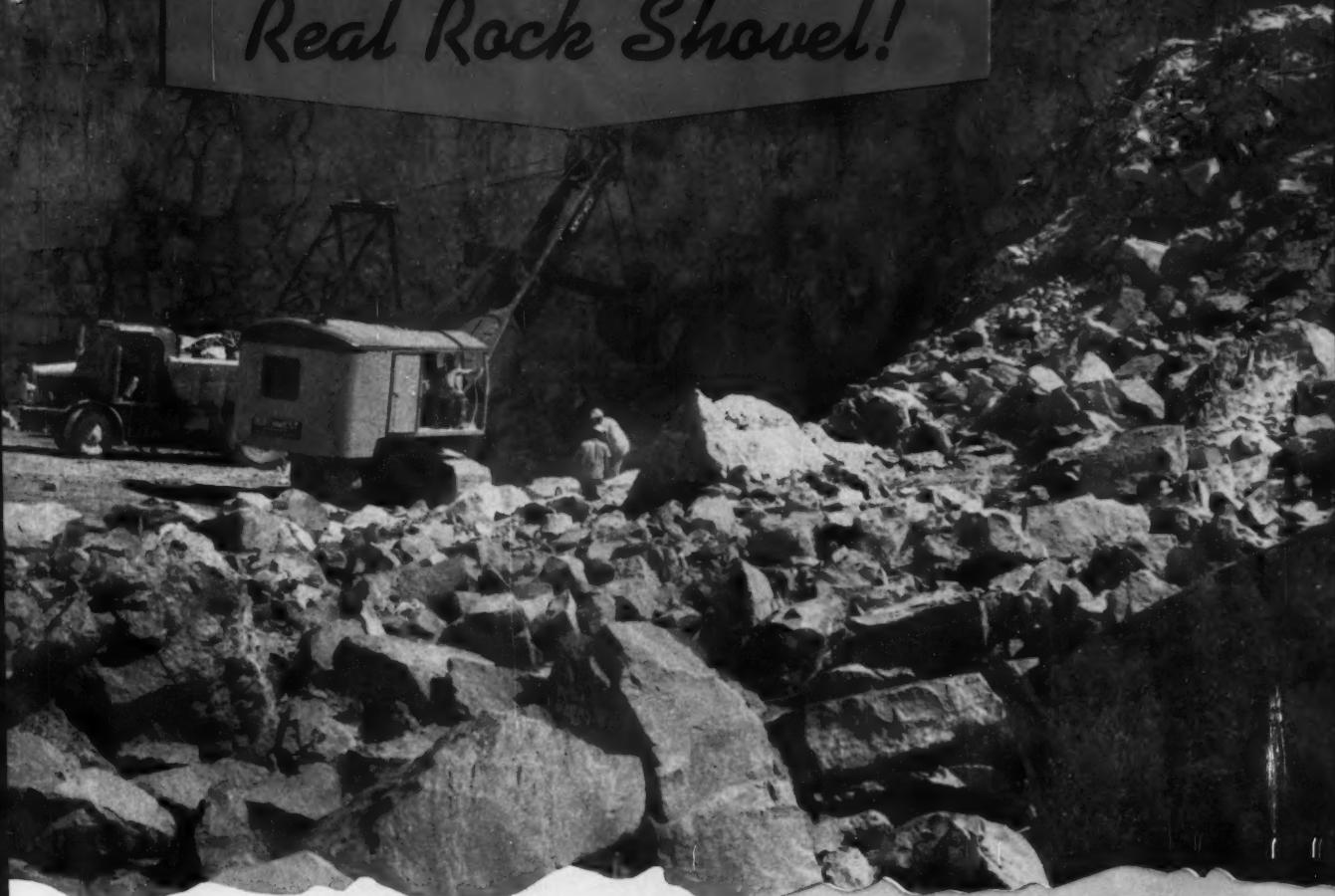
STEEL PRODUCTS COMPANY
AKRON 1, OHIO / INTEGRITY, QUALITY, ACCURACY, DEPENDABILITY

Firestone Perma-Tite Rims



In a FACE like this...

YOU NEED A
Real Rock Shovel!



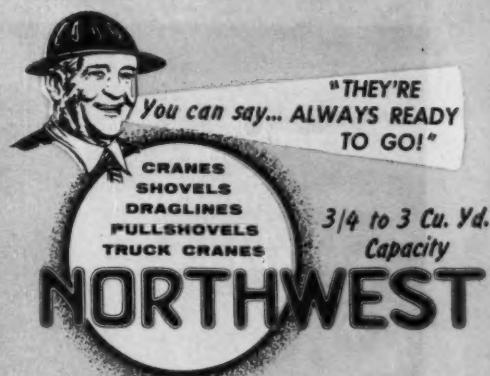
ON a job like this, moving rock is not a matter of hours—it's a matter of days—weeks—months! It's not a matter of the cost of moving the tonnage of today's loading. What will be the cost per ton over the next six months—or year.

We have said before, shovel output is not measured by the speed of the hoist or the swings per minute. Production and profit is the result of constant day-in, day-out, month after month operation.

Your Northwest is a *real* Rock Shovel, a proved Rock Shovel. The Northwest Dual Independent Crowd handles harder digging and more yards per hour. The big Uniform Pressure Swing Clutches, assure spotting, a real time saver. From its heavy duty Cast Alloy Steel Bases to the ample power of its engine, its ease of control, its smooth mobility, every advantage combines to assure, not just output for the day, but continuous output. These are the things that get the job done—the things that make it possible for you to say, "That Northwest is always ready to go!" They are among the features that make the Northwest the finest machine of its kind.

Details make equipment! Dig into them. A Northwest man can help you.

NORTHWEST ENGINEERING COMPANY
1503 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

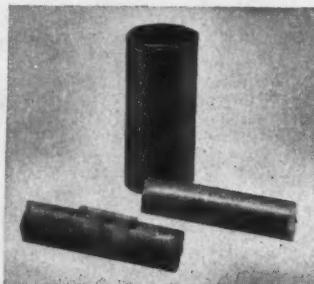


WHEN BLASTING CONTROL REALLY COUNTS...

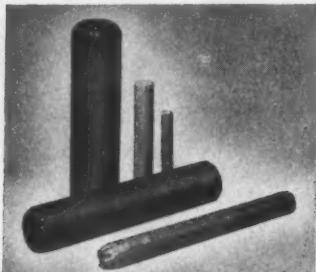
WHICH EXPLOSIVE?



ATLAS PELLETS, a new form of ammonium nitrate, have both the density and sensitivity for efficient AN-oil blasting.



GIANT "75" PRIMERS have the wallop for complete detonation of both field mixed and plant mixed blasting agents.



GIANT GELATINS are for high velocity shattering action. Advantageous for wet work and hard, tight shooting.



ROCKMASTER® electric blasting caps achieve the staggered action so important for better breakage and control.

When you use the right combination,
all your equipment
moves in sooner...
works faster...
produces more.

In the center of Stroudsburg, Pa., a cut 2500 feet long and 85 feet deep had to be blasted out of the mountain-side for construction of the new U. S. Route 611. Some residences were as close as 100 feet from the construction site. The job called for real controlled blasting and virtually no vibration.

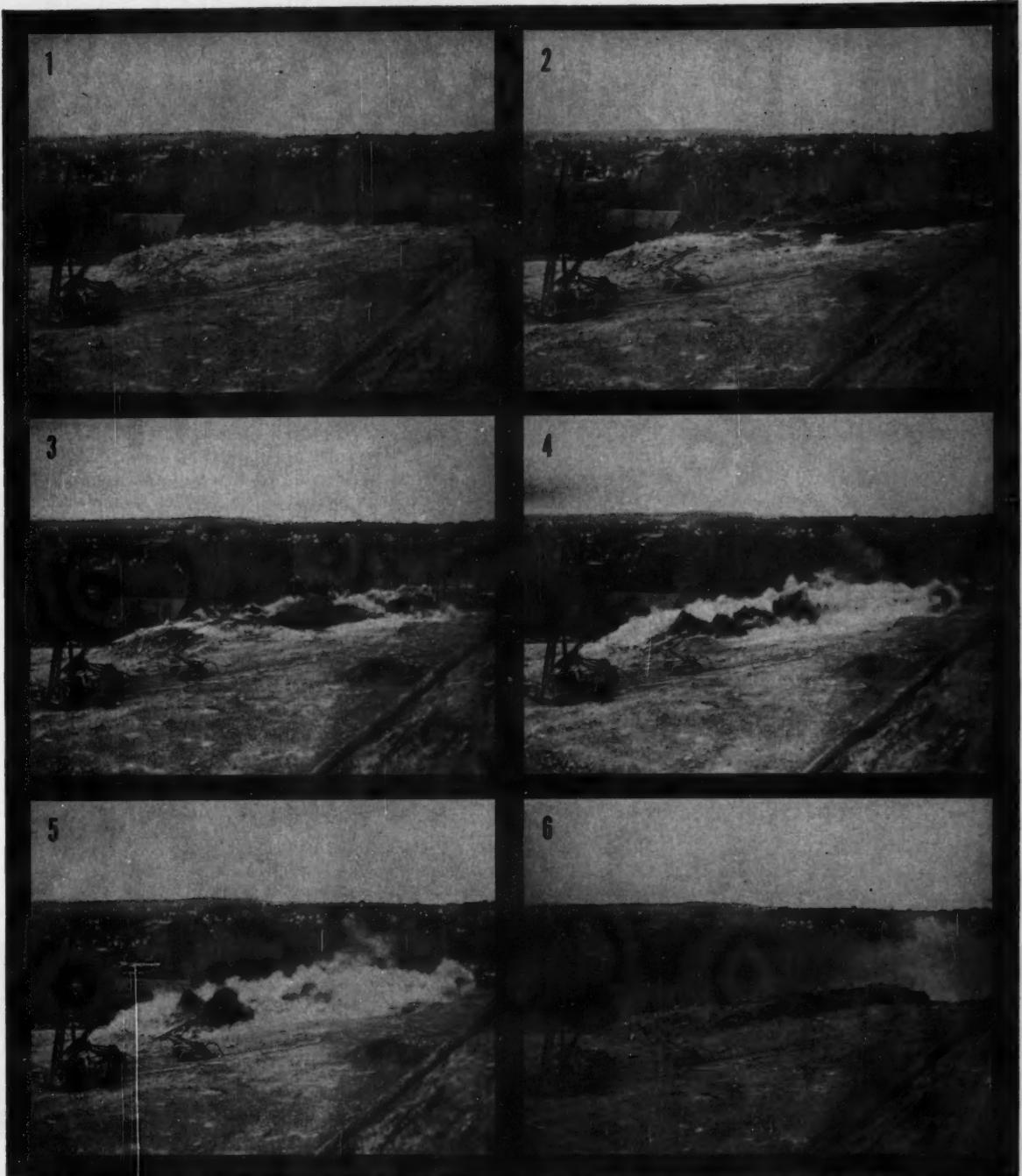
Working with an Atlas Technical Representative, the contractor, J. H. Beers, Inc., studied the site, the rock strata, and the surrounding area. Relying on advanced blasting technology to assure absolute control, they planned their blasting methods.

Which explosive for controlled blasting? It all depends on your rock strata and conditions. But, in this case they used Gianite pre-mixed ammonium nitrate blasting agent, detonated with Rockmaster millisecond delay electric blasting caps. The 2½-inch holes were spaced 7 feet apart, and were drilled to an average depth of 10 feet with 6 feet of stemming. In the sequence of photos, notice the "rippling" effect resulting from the use of the full Rockmaster series. There is no flying rock or noticeable vibration. The explosives energy is used only to uniformly break the rock and leave it in place for easy, efficient digging.

This blast is a dramatic example of the sometimes necessity for real controlled blasting. But blasting control should not be a sometimes practice. Controlled explosives energy not only breaks rock uniformly and thoroughly, but also means more economical operation. When you select the right combination of explosives, blasting agents, and blasting techniques, all your equipment moves in sooner, works faster, produces more. Helping you select the right combination is the job of your Atlas Representative. Backed by the complete Atlas line (including all forms of ammonium nitrate), he can help you get maximum control on every shot.

Our blasting cost chart, slide rules, and technical literature are designed to help you achieve maximum control and determine your lowest true blasting costs. Ask your Atlas Representative about them—or, write directly to:

ATLAS POWDER COMPANY
Explosives Division, Wilmington 99, Del.



STROUDSBURG, PA. BY-PASS ON U.S. RT. 611 • CONTRACTOR: J. H. BEERS, INC., BANGOR, PA.

Rockmaster® millisecond delay electric blasting caps detonate Gianite pre-mixed ammonium nitrate blasting agent in this controlled shot. Explosives force breaks rock uniformly and

thoroughly for easy digging. In-place blasting eliminates rock throw in congested areas. You'll get safer blasting . . . fewer complaints from near-by neighbors.



ATLAS EXPLOSIVES

HOW TO SAVE \$50-75 DAILY, SPEED CUSTOMER SERVICE

B. W. Beeman, Anderson, Ind., lowered handling costs and increased production of clay-gravel base mix by replacing a hopper-fed portable conveyor with a 48' Barber-Greene PS-70 Portable Screening Plant with trap feeder.

The gravel company owner reports: "Our new plant helps us save \$50-75 on the 500-1,000 tons produced daily. Now we doze material directly from bank to trap and save 10-15¢ per ton handling costs. We've speeded customer service, too, by being able to load out 10-ton trucks in 60 seconds. And the

consistent accuracy of clay-gravel mix obtained by our dozer blending through the trap feeder gives us a competitive advantage that has brought in considerable new business."

Here's why your Barber-Greene Distributor can match this new plant to your needs: capacities—155, 270, 430 and 630 tph . . . belt widths—18, 24, 30 and 36" . . . conveyor lengths—42 and 48" . . . single deck screen sizes—36, 42 and 48". Get this rugged plant with exclusive Vibra-Spring screen suspension and save money and time producing sized aggregates.

Heavy-duty portables cut stockpiling costs

J. P. Hollerich & Co., LaSalle, Ill., paving contractors, save time and money unloading and stockpiling aggregates for asphalt operations by teaming two portable Barber-Greene units, a 358 Hopper Car Unloader and a 24" x 66' PA-70 Conveyor.

Plant Supt. F. J. Funsinn and Gen. Supt. John E. Livec relate: "Our Barber-Greene units give us the de-

pendable high-capacity performance we need to keep our plant operating at top capacity. The unloader-portable conveyor team has unloaded 65,000 tons of $\frac{3}{4}$ " stone and sand at 120 tph, and we empty and stockpile 56 tons of rock from a car in just 30 minutes."

Highly-portable Barber-Greene 358 Car Unloader and truss-type PA-70 Portable Conveyor are shown unloading sand for Hollerich's Barber-Greene 894 Batch-Omatic plant located at Atkinson, Ill.





The Beeman-owned PS-70 plant has a 36" belt and a double loop Vibra-Spring screen suspension that puts 35% wet clay over

the screen without blinding. This exclusive feature also doubles the shock resistance and life of vibrating mechanism parts.



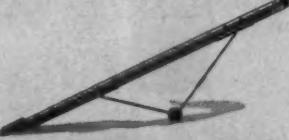
Model 358—Car Unloader



Model 362—Portable Conveyor



Model 363—Portable Conveyor



PA-80—Portable Conveyor

Barber-Greene portables for every requirement

Barber-Greene's portable materials handling equipment line includes seven truss and channel frame Portable Conveyors plus the 358 Car Unloader. Biggest of the truss models is the PA-80, available in 69, 75 and 81' lengths, available with torque-arm or line shaft drive. Other heavy-duty truss models, all in lengths

from 33-60', include PA-70 (torque arm drive), PB-70 (V-belt drive) and PC-70 (line shaft drive). Model 363 tops the channel frame line and is offered in 25, 30, 35, and 40' lengths. Model 362 is available in 20, 25 and 30' lengths. All are precision built and completely portable.

SEND FOR NEW BULLETIN

New Portable Conveyor Bulletin tells how these rugged units can cut your handling costs, shows how to select the correct models for every requirement, and includes full information about each conveyor in the complete Barber-Greene line. Ask for your copy today.

The ultimate in precision-built portable conveyors

Representatives in Principal Cities of the World

Barber-Greene

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia



CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT



DON'T WAIT FOR SMOKE SIGNALS!

Smoke signals from an engine are signs of excessive engine wear and poor engine performance... signs it's too late for effective preventive maintenance! Modern engines demand top filter protection. And Fram Filters keep engines running clean... prevent excessive engine wear and keep fuel consumption to a mini-

mum! No wonder more manufacturers install Fram Filters as original equipment than any other filter! When it comes to preventive maintenance, remember-Fram Filters give you the most advanced filter protection available today!

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OIL AIR FUEL WATER
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Construction News From Washington

Washington, D.C.
September, 1960

Who Manages Missile Base Building?

The government's drive to speed up construction of ICBM bases has involved about every organization possible: the Department of Defense, the Air Force, the Army Engineers, the construction unions, the industrial unions, the missile manufacturers and their trade associations, and the construction contractors and their trade associations. Involved is some \$635-million in construction contracts already out, an estimated \$400-million of new contracts next year—and more still to come after that.

The Air Force has given the top management responsibility for ICBM site activities to the Air Materiel Command. Maj. Gen. Thomas P. Gerrity of AMC's Ballistic Missile Center at Inglewood, Calif., is in charge. He presumably has the authority to make binding decisions. Authority heretofore had been divided among several military commands.

Army Engineers Centralize Control

A new "ballistic missile construction office" has been created by the Corps of Engineers, with Maj. Gen. Alvin C. Welling in charge. The new office takes over and will expand what was the Los Angeles Engineer Field Office. A staff of about 300 is being assembled to ride herd on all ICBM base construction; more men are being deployed to missile base construction sites.

Gen. Welling reports directly to the Chief of Engineers, which means the regular Corps of Engineers district and division offices no longer have jurisdiction over missile base construction. Welling has assigned responsibility for each type of missile base to an officer reporting directly to him.

While the Army Engineers are still in the picture as the agency letting and supervising construction contracts, the Air Force is pressuring to give the missile manufacturers the authority to subcontract the construction work at the bases, just as they subcontract for components for the missile itself.

Who Can Build Missile Bases?

The Engineers have already tightened up the eligibility requirements for prime contractors in order—among other things—to eliminate bid brokers. Now any prime must do at least 15% of the construction work himself.

The Army Engineers, as CM&E went to press, were under pressure to drop advertised bidding for ICBM base construction in favor of negotiated bids. The Engineers seemed certain to take a step in

Construction News from Washington . . . continued

this direction—that is, setting up a special list of contractors found to be qualified for missile base work on the basis of experience. Bids from those not on the list would not be considered. Such a "rigid system of prequalification for bidders" would be designed to eliminate companies with unfavorable work records, insufficient capital, or other deficiencies.

Missile Base Labor Czar?

Construction officials and government officials are hoping that the Labor Department won't have to issue specific criteria on Davis-Bacon wage rates on ICBM sites. Instead, the hope is that a special adviser to Labor Secretary Mitchell—former Army Engineer Colonel Clarence Barker—may be given authority to rule on a case-by-case basis as to whether building trades or the production workers will get the work.

Cheaper Money Brightens Construction Outlook

Easier money and lower interest rates for mortgages, bonds, and construction loans hold out the promise of a financial boost for construction, Washington economists agree.

A hefty backlog of pending projects has been awaiting more favorable borrowing terms. Quick sale last month of \$200-million of revenue bonds to build the postponed toll-highway crossing at the mouth of Chesapeake Bay—17 mi of bridge and tunnel construction—highlighted an accelerating shift that has taken place in the money market during the last 9 months.

Additional construction stimulants have come from money-easing actions of the Federal Reserve Board and liberalized lending rules of the government housing agencies. If lendable funds and lower interest rates can do the job, construction will see an upturn in contract awards before election day.

More Highway Contractors

Highway contractors have been getting a chance to bid on a bigger selection of federal-aid jobs as the result of revised government rules on the rate of contract awards by the state highway departments. Further, federal highway officials predict that the boon will extend into the second half of the fiscal year, beginning Jan. 1.

Since the beginning of the fiscal year, July 1, the states have had authority to award federal-aid contracts in larger volume and at a faster rate than stipulated originally. The Bureau of Public Roads in early June had told them they could obligate \$2.9 billion of federal highway funds this year, but only at a rate of 25% per quarter. By July 1, this rule was liberalized to allow obligation of the full first half allotment (\$1.45 billion) as fast as they could get the jobs advertised and contracts executed.

Highway Administrator Tallamy now expects the states to receive authority Jan. 1 to obligate the second half of the bundle as rapidly as they wish in the final six months of the fiscal year.



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LUBE LOGIC

Five tips to

Texaco "lay-away plan" protects exterior of idle equipment

Equipment that won't be needed for a while is sometimes simply parked somewhere so nobody will fall over it. Well and good, but not enough—because rust and corrosion account for almost half of what you spend on equipment maintenance. Here's a 6-step program that

will keep idle equipment in cracker jack shape no matter how long it's out of use, or where it's stored. The basic ingredient is Texaco Rustproof Compound L—a remarkable product that keeps rust from starting, and acts to loosen rust that's already on the equipment.



1 Before applying Texaco Rustproof Compound L, make sure all exterior surfaces are clean and fairly dry.



2 Coat all adjustment bolts and other exposed threads with Rustproof Compound to facilitate removal or adjustment.



3 At temperatures of 65° or more, Texaco Rustproof Compound L can be applied to smooth accessible surfaces by brushing.



4 At temperatures below 65°F, or for inaccessible and complicated areas, spraying is the best way. You can thin the Rustproof Compound to a sprayable consistency by adding naphtha to form a 10 to 50% solution. Add the naphtha slowly to the compound and stir vigorously so the whole batch is the same consistency.



5 Apply tags at conspicuous points on the equipment describing the rustproofing measures that have been taken.



6 Thoroughly lubricate all equipment before storage.

Starting up equipment after storage



1 In most cases it's not necessary to remove Texaco Rustproof Compound L. You should, however, remove it from surfaces that will come into contact with personnel (such as ladders, seats and handles) and from surfaces that are heated to high temperatures when the equipment is operated.



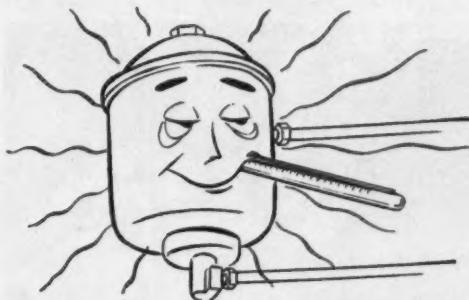
2 Since Texaco Rustproof Compound L is not a lubricant, all working surfaces and lubrication fittings should be wiped clean before use, and the correct lubricant should be applied before starting up.

Thicker oil won't stop gear-case drooling

You can't fix leaking seals on a gear-case simply by switching to a heavier-grade gear lubricant, because in gear cases carrying heavy loads, the thicker oil simply increases gear-case temperature, which thins out the oil and it starts leaking again. Sometimes,

however, foaming and leaking of gear-case lubricant indicates that the oil level is too high. By keeping vents open and keeping the oil at the recommended level, you prevent build-up of pressure which would cause leakage.

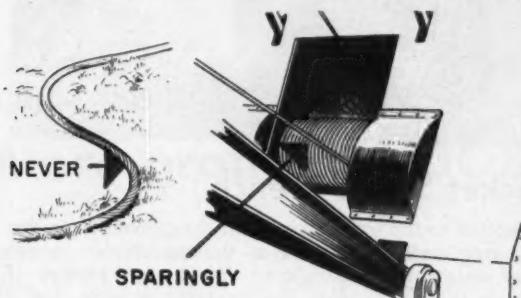
trim maintenance costs



A filter that's working runs a temperature

Oil filters last so long these days it's sometimes hard to say when they were last changed. But they're so important to engine performance that it's essential that you know whether they're too full to filter right. Here's a simple way to find out.

A filter that's working will be as warm as the engine oil. If the filter on a fully warmed-up engine remains cool to the touch, it's a safe bet that it's too clogged up to let any oil through. Just to double-check, tap the filter case sharply. A metallic ringing sound means the cartridge is still in good shape. A soggy thud often means that the filter is loaded. Top mileage for even the best filter is 6,000 miles, never more.



How often should you lubricate wire rope?

How much lubrication is good for wire rope and cable depends mainly on how it's used. Cables that are dragged in dirt shouldn't be lubricated at all. Oil simply holds the dirt where it can work into the strands and cause rapid wear. Cables that are wound on drums equipped with clutches should be lubricated sparingly to prevent fouling the clutch faces with lubricant. With other wire ropes, apply Texaco Crater A every 10 to 100 hours as necessary to avoid dryness. Be sure to clean the rope before adding new lubricant.



Crawler treads are happier dry

There are few places where good lubrication is more important than in track-roll bearings, but make sure you don't lubricate the crawler treads themselves in a burst of enthusiasm. The pins that connect the links of crawler treads are designed to operate without lubrication, because dirt or other abrasives would act as a lapping compound in service. Result: much shorter service life for the track. Moral: if you don't want to lap your crawler link pins, don't oil them.



TEXACO LUBRICATION ENGINEERS

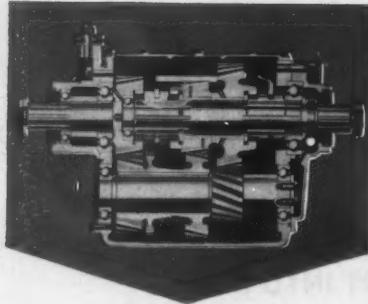
Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

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RATIOS

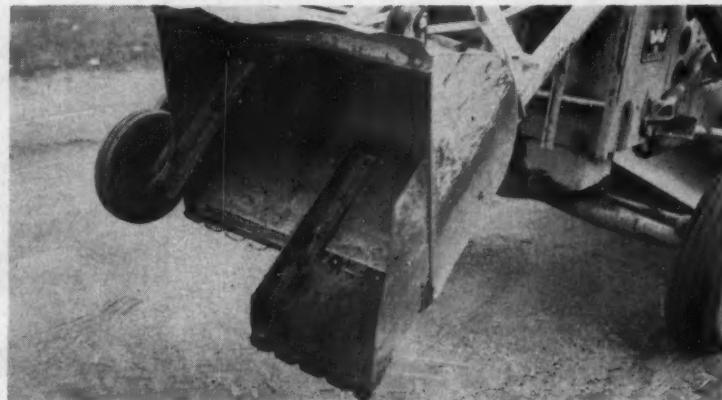
MODEL	SPLITTER RATIOS			DEEP REDUCTION
	High	Intermediate	Low	
3-A-92	.74	1.00	2.09	
3-B-92	.84	1.00	1.24	
3-C-92	.75	1.00	2.64	
3-D-92	.75	1.00	1.24	
3-E-92	.84	1.00	2.09	
3-F-92	.84	1.00	2.64	
3-G-92	1.00	1.327	2.09	
3-H-92	1.00	1.327	2.64	



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 Circle 18 on Reader Service Card

Job Talk...



Scoop on Bucket Skims Trench

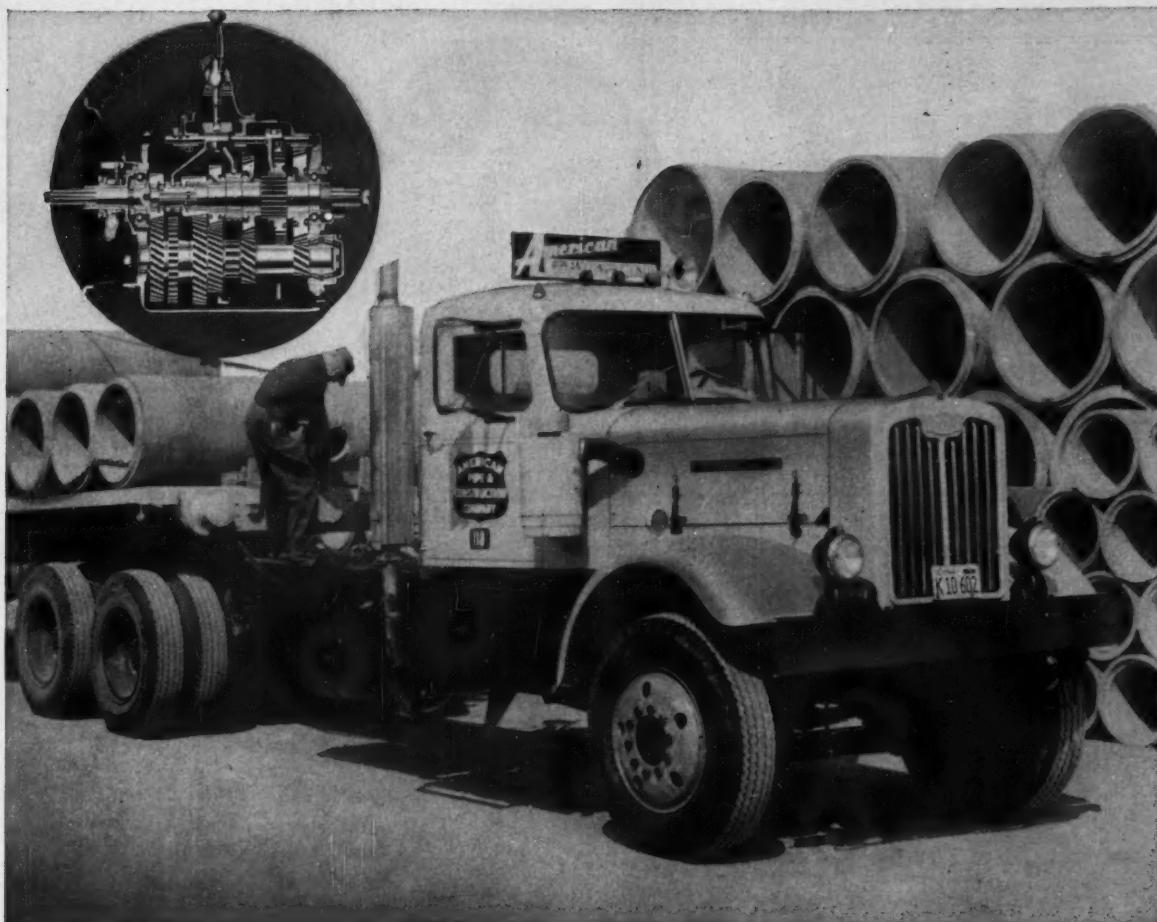
A wheel and a scoop bolted to the bucket of a Huber-Warco maintainer make paving of water and sewer line trenches after the service is installed a much simpler job for Joseph Noonan and Sons, Inc., of Saratoga Springs, N. Y.

Ordinarily Noonan's first step in this repair operation is to remove excess material at the top of the backfilled trench to a depth of about 5 in. The special scoop bolted at one side of the bucket effectively does this chore. It's a few inches narrower than the ordinary trench, and when tipped down all the way will cut to a maximum depth of 8 in. The wheel at the end of a leg bolted to the other side of the bucket holds the bottom edge of the scoop at the correct cutting level.

Excess fill flows back into the bucket as the maintainer moves forward. When the bucket is full, the operator simply dumps it into a truck standing by to haul material away. The maintainer makes as many passes as necessary across the width of the trench to remove all excess material. Noonan is then ready to pave the strip.

They place crushed stone rubble into the trench from a small chute located in the tail gate of the truck. Then they run the truck wheels in the trench to compact the stone to within 2 in. of the pavement. Finally, hot-mixed blacktop is compacted with a tandem roller until it is level with the rest of the pavement.

continued on page 25



American Pipe and Construction Co., operating throughout the West from headquarters near Los Angeles, offers a wide range of reinforced concrete pipe for virtually every water supply, sewerage and drainage pipeline requirement. The company chose Fuller 5-C-720 Transmissions for heavy hauling because of their work-matched gear ratios, low gear-tooth pressures, helical gearing in all forward speeds, short length and light weight.

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More profit from JOB-SPECIFIED Transmissions

Whatever you're moving — concrete pipe or cotton, radishes or rock — there's a Fuller Transmission to help you do the job faster, easier and more profitably. Fuller offers:

- 88 models of heavy-duty transmis-

sions for trucks, construction equipment and industrial use.

- Capacities matching gasoline, diesel and LPG engines . . . from 330 to 1550 cubic inches . . . up to 600 hp.
- Models available with manual and

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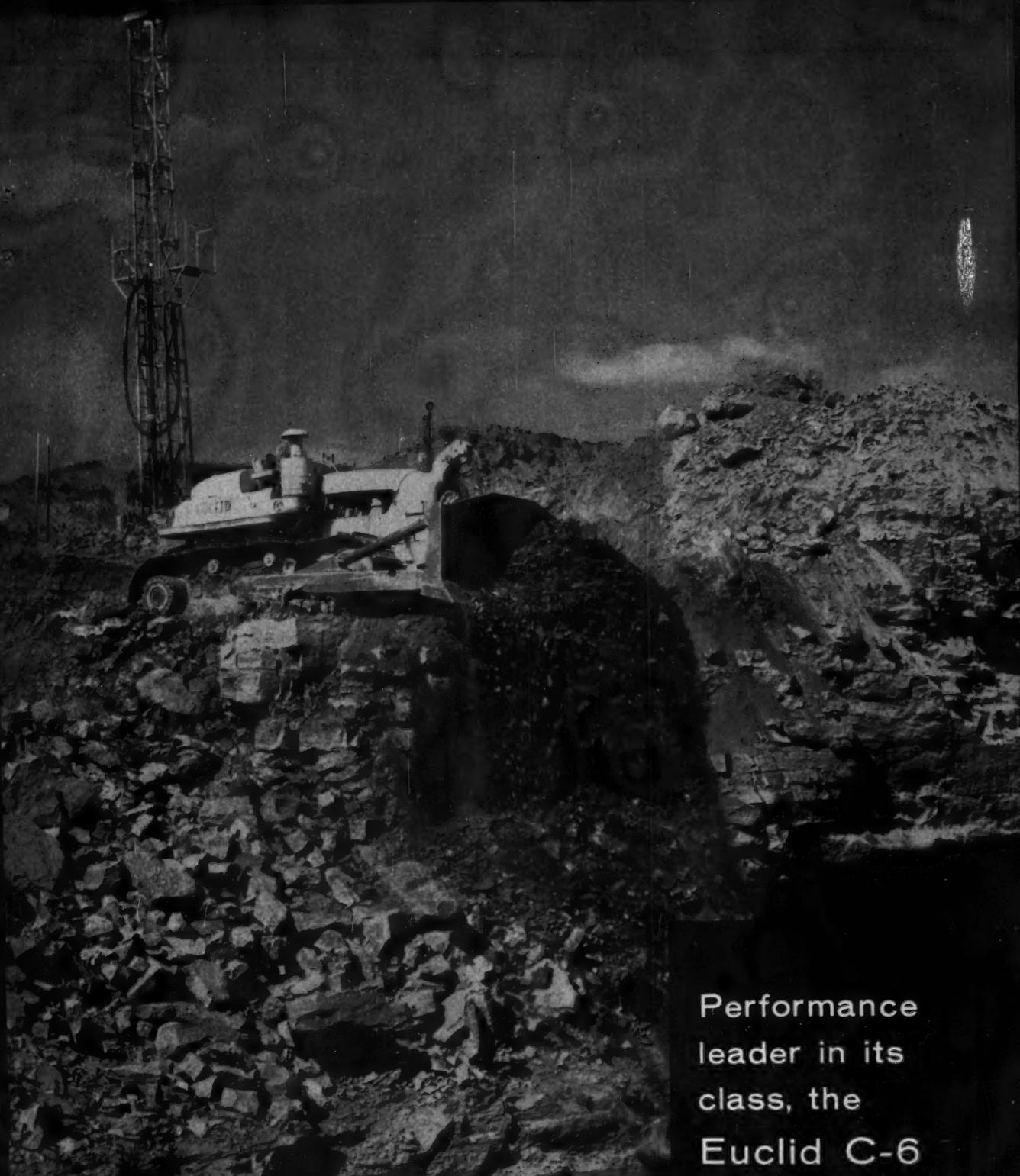
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Performance
leader in its
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Euclid C-6
gives you
another major
advantage



Savings in engine costs alone make the "Euc" C-6 today's best tractor buy

In the Euclid C-6 you get the advantages of job proved power train components... the reliability of the GM 6-71 engine, Allison Torqmatic Drive and Euclid's famous planetary drive... that help keep downtime to a minimum. You get designed-in service accessibility that's unsurpassed by any competitive crawler... servicing or complete removal and replacement time is well below that required for comparable tractors.

You get a big advantage, too, in the lower cost of engine replacement parts... savings that cut your maintenance expense to the absolute minimum. For example, pistons and rings for two competitive engines are 79% and 163% higher in cost than for the GM engine; a water pump 255% and 257% more; up to 120% more in replacement of complete engine from fan to flywheel.

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Plants at Cleveland and Hudson, Ohio
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*Full-power shift... fast-as-a-fox
maneuverability... and greater
over-all work-ability!*

Have your dealer give you all the facts and figures on the C-6... you'll find that in production and maintenance cost this "Euc" gives you a better return on investment.





C-6 service accessibility cuts replacement labor costs, too!

Assuming good shop conditions and experienced personnel, these are typical times for removal and replacement of components in the C-6 and other torque converter tractors of the same class:

Component	Man-Hours	Others
Radiator	3	10
Engine	8	16
Clutch	none	16
Drive Sprocket	8	9.8*
Track Frame	3*	8**

*requires 70 ton press only
**requires special tools and 100 ton press

HOURS SAVED IN THE SHOP MEAN MORE WORK-TIME ON THE JOB!



EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

Set Your Sights on Homelite

For clearing land for building . . . for cleaning up after windstorms . . . you bring profits into focus when you set your sights on Homelite. Two new Homelite One-Man Chain Saws have just been introduced . . . the 700D direct drive and the 700G gear drive. These two new models with seven big improvements give you 10% more cutting power. One man can do your cutting faster with

less fatigue on him and with less cost to you. As for maintenance, Homelite has always been famous for very low maintenance costs. In fact, a full 7-month guarantee goes with each of these saws. As for service, Homelite Factory Branches and Chain Saw Dealers are located throughout the country. This "next-to-your phone" service cuts downtime for repairs.

Homelite chain saw dealers and Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call or write for convincing demonstration or fast service in any way.



HOMELITE
ONE MAN CHAIN SAWS
PUMPS • GENERATORS • CHAIN SAWS • BLOWERS

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Circle 24 on Reader Service Card



Scrapers Push Load Each Other

By putting specially fabricated push plates on the front ends of his scrapers, a Nebraska contractor push-loads the big units in pairs. This replaces slower crawler-tractor units.

Smith Bros. Engineering & Leveling Co., of Kearney, specializes in soil conservation earthmoving. This kind of work involves moving small quantities. They often have several jobs going at once. On some days, their five Allis-Chalmers T S-260 scrapers may work on two or three different job sites within a 5-mi radius. This means that equipment has to move quickly.

With scrapers push-loading scrapers, Smith combines heaped load production with speedy operation. He can road the units to move them to another job without the time-consuming job of moving pushers on a low-boy.

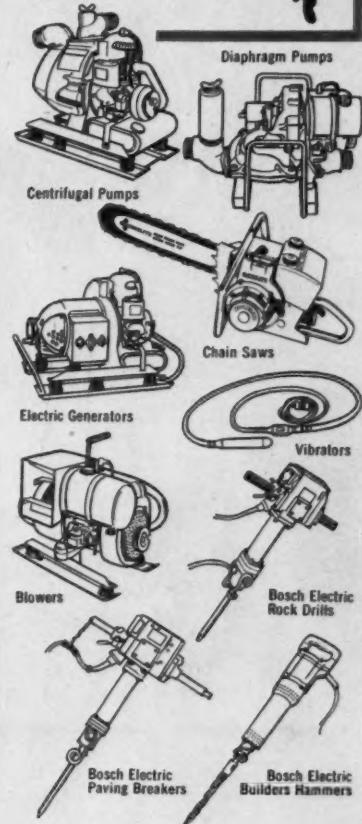
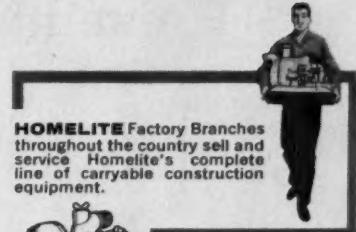
Smith made the push plates out of $\frac{3}{4}$ -in. steel plates measuring 28 x 44 in. They put the plates in a press to curve them about 2 in. at the center so they would fit the push block at the back of the scraper being loaded. Four ribs cut from another $\frac{3}{4}$ -in.-thick plate and welded to the push

plate back it up. Notches cut in these ribs fit the bumper at the front of the A-C scrapers.

The scrapers usually work in pairs on the typical small Smith job. One empty scraper loads the other. Then the loaded scraper swings around behind the empty one and push-loads his partner. The loaded unit push-loads faster than the empty one because its additional weight increases traction. With an empty scraper pushing, a heaped 14 to 17-yd load of sticky clay can be loaded in about 70 sec. In easier-to-move dirt, loading time may average as low as 40 sec.

Sometimes on larger jobs Smith has all five of his TS-260's at work together. At times they line up four in a row while push loading. But ordinarily two scrapers combine to tandem push a third, while the other two are coming or going to the fill. By the time the scraper loading gets a heaping payload, one of the other scrapers arrives from the fill and pulls in behind to help push-load the one next in line at the front. The loading cycle is seldom broken for more than a few sec.

continued on page 29



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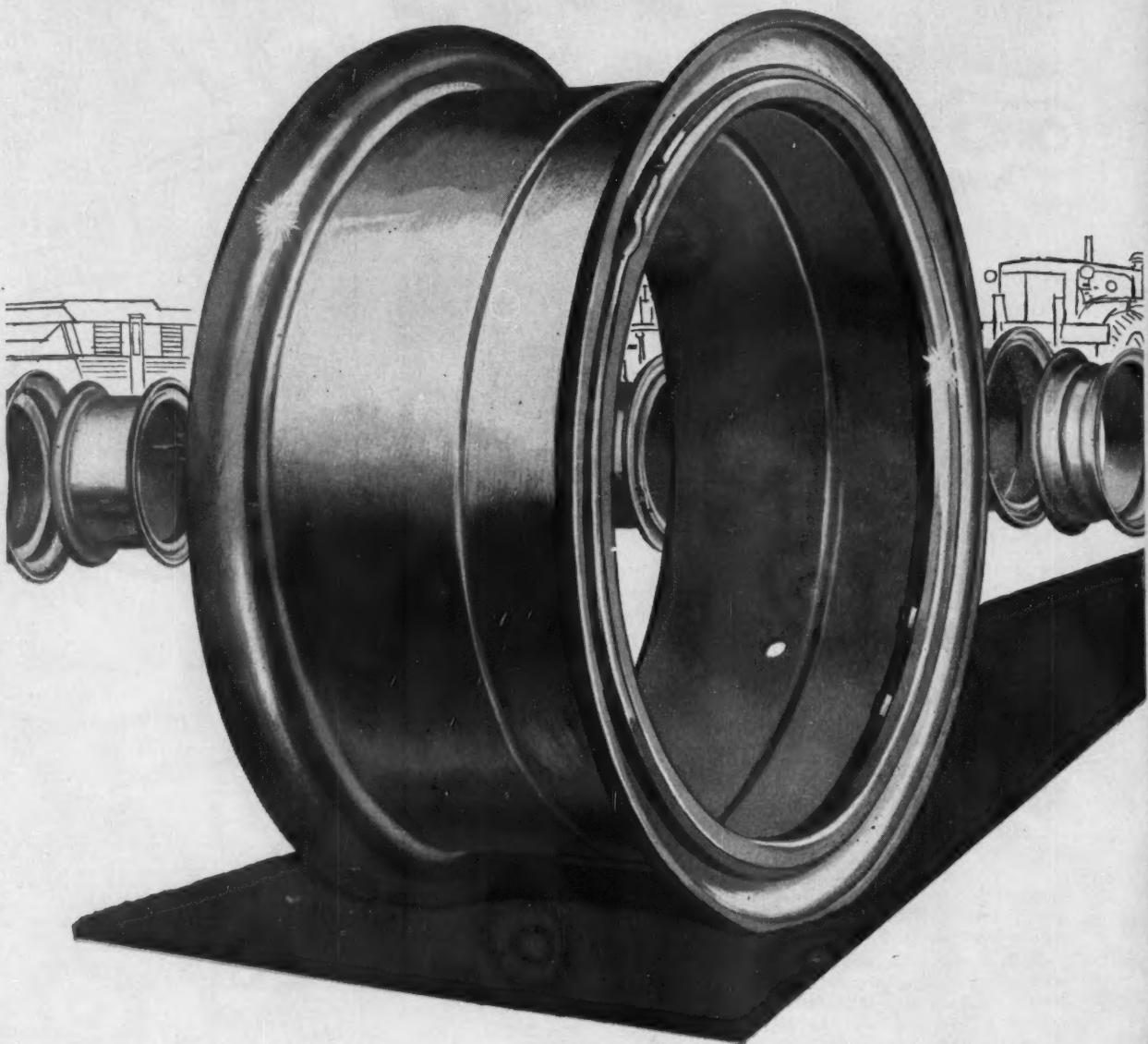
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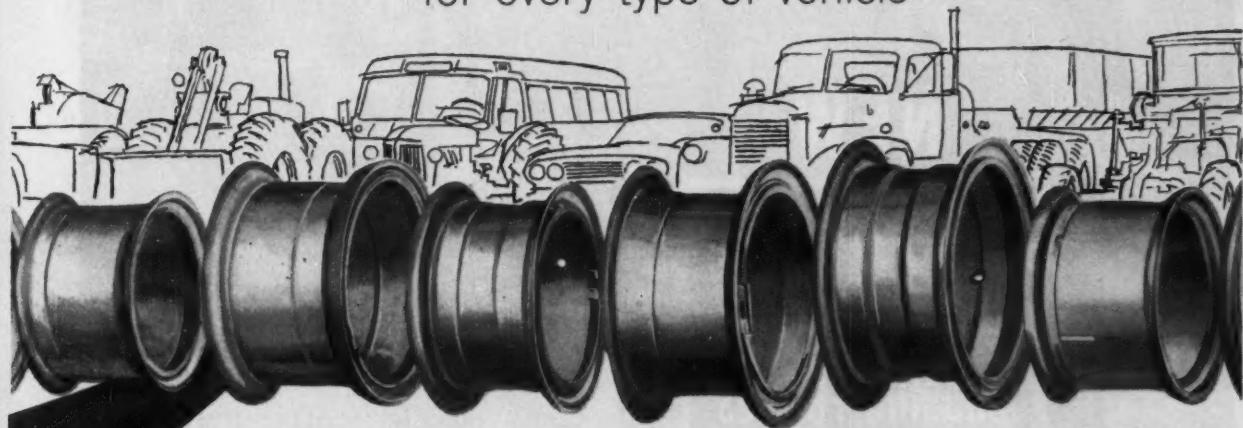


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MILLIONTH RIM

Latest, greatest in the world's most complete line of rims, designed to provide superior performance for every type of vehicle



Some time this month, from Goodyear's huge modern facilities in Akron, will come the 60 millionth rim to be manufactured by the world's leading tire-maker.

Most likely it will be a Job-Master.

And this is appropriate, for the Job-Master is the culmination of Goodyear's long experience in building rims for every type of vehicle.

The Job-Master is the first rim designed to fit properly all flat-bead tires—the first designed to seal out all foreign matter. In fact, Job-Master represents the biggest advance in "over-the-road" rim design in over 15 years.

But Rim No. 60,000,000 could just as well be anything from a lightweight rim for pick-up trucks to a mammoth 45" size for giant earthmovers.

Whatever size and type this historic rim happens to be, of this you can be sure: it will embody every advantage

that Goodyear engineering skill can give it—and that's considerable. For example:

Longer rim life—because they're job-designed by experts.

Truer running performance—virtual elimination of "wobble" and "hop"—lateral and radial run-out.

Longer uninterrupted service—fewer road delays, more miles, lower cost-per-mile.

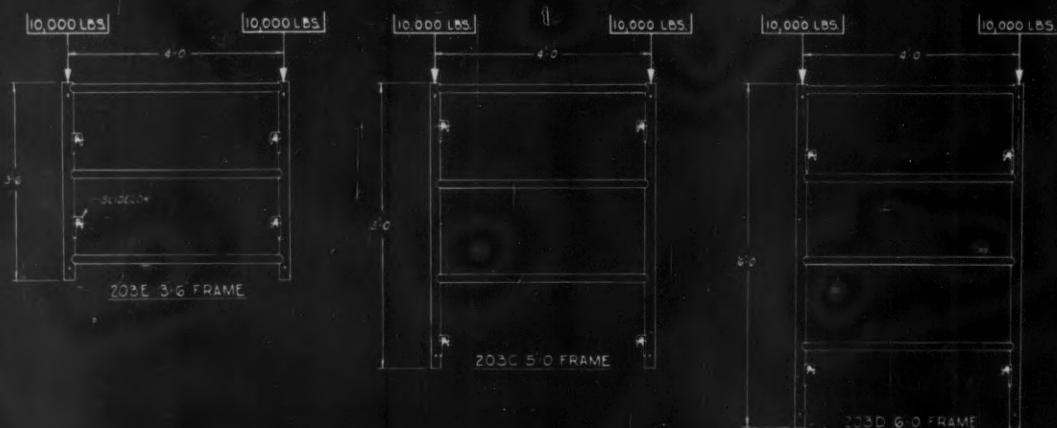
Bond-A-Coat Finish—a Goodyear exclusive, providing lasting protection against rust and corrosion.

Our industry leadership, experience and knowledge gained in building 60 million rims qualifies us to solve your rim problems. Write the Goodyear Rim Sales Engineer. Address: Goodyear, Metal Products Division, Akron 16, Ohio, or get in touch with your local Goodyear Rim Distributor.

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CARRY LOADS
UP TO
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**Monster Crane
Lifts Rig 60 Ft**

A Mutt and Jeff act recently thrilled spectators at the Cleveland works of the Jones & Laughlin Steel Corp. A giant Model 775 P & H truck crane hoisted a Lorain truck crane weighing 68,000 lb to the top of a 60-ft-high structure that will house a new basic oxygen furnace.

Subcontractor Mak Construction Co. of Cleveland originally considered erecting a guy derrick on top of the structure to handle placement of 1,500 tons of dust-collection equipment. But because the equipment has to be erected in sequence, they would have had to move the derrick at least 15 times to reach all lift positions.

The maneuverability of the truck crane made it a heavy favorite over the derrick. It will travel on wooden mats the entire length of the 105 x 250-ft building, easily covering the roof area.

The big lift took only about 45 min. The P & H rig was equipped with a 120-ft boom for the lift. Its rated capacity is 90 tons. Maximum lifting radius was 35 ft. On the way up, the 25-ton-capacity Lorain carried a 30-ft boom, but it will sport a 100-ft boom and a 15-ft jib when it begins erecting the dust collecting equipment. Western Precipitation Division of Joy Manufacturing Co holds the prime contract for its installation.



SIDE DUMPS
for ROCK,
EARTH,
ORE

**PAN ▶
TYPE**
truck bodies
and trailers
14 to 45 TONS
dumped by
EASTON electric
overhead hoist



**◀ DROP
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truck bodies
and trailers
14 to 40 TONS
dumped by
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pan type and
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capacities
unlimited



Variable
Wheel Base

**◀ REAR
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TONS**

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Circle 29 on Reader Service Card



Multi-million dollar picture. Here is part of Western's equipment lined up for inspection at Oahe Dam. Photo shows 86 trucks, 23 bulldozers and crawler pieces and 9 scrapers.

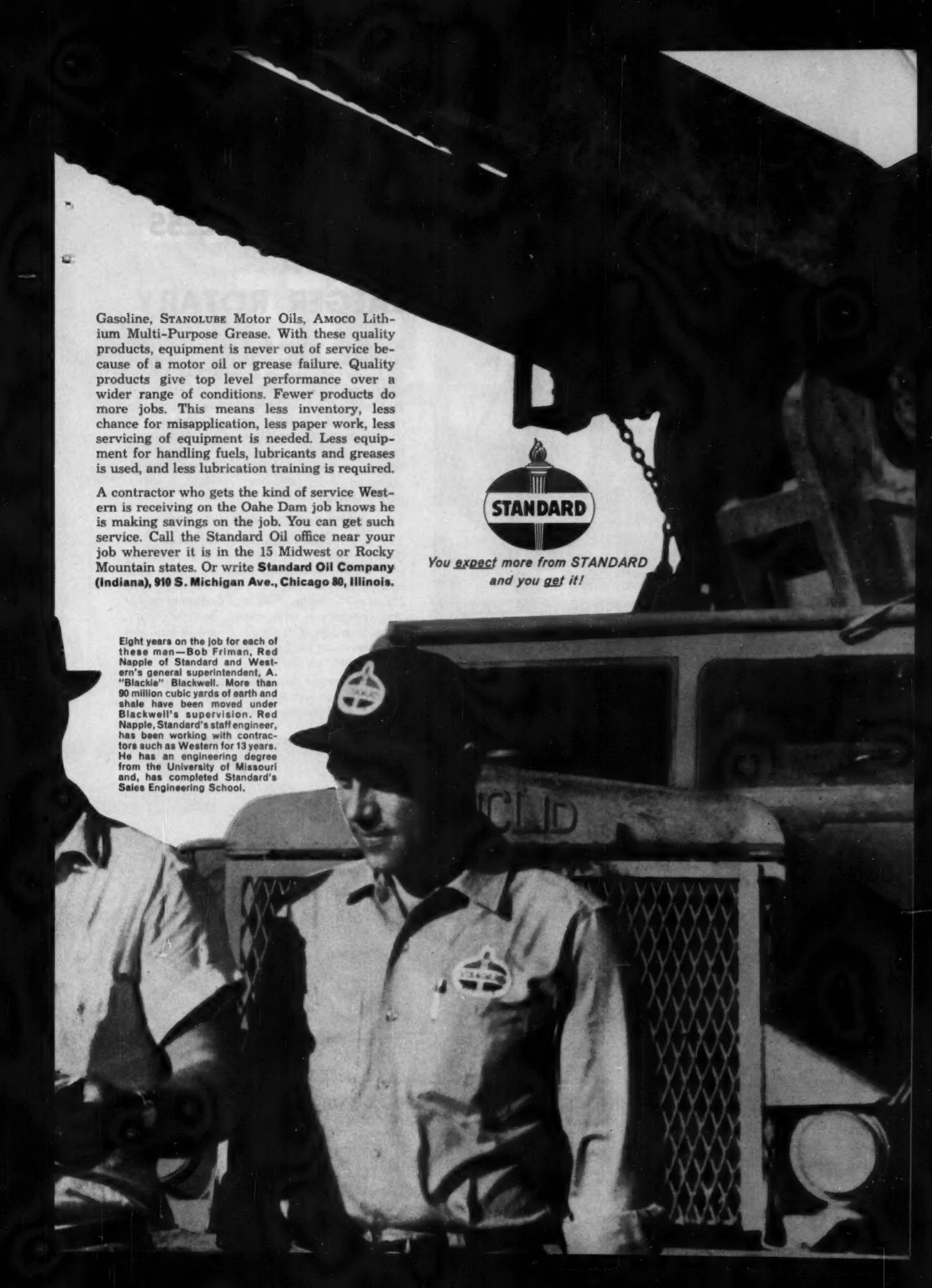
2 ways Standard Oil helps Western Contracting Corporation save on Oahe Dam job

In eight years on project, 10 million gallons of diesel fuel and gasoline have been delivered on time and when needed

Saving No. 1 F. L. "Red" Napple, Standard Oil staff engineer, and Standard Oil agent Bob Friman have been serving Western on the Oahe Dam project since the first dirt was moved in 1952. This means continuity of service that can be invaluable to a contractor. Red Napple has an engineering degree plus more than 13 years' experience in just this kind of work. Western thus has the equivalent of another engineer helping them. Napple is located at Aberdeen and Friman at Pierre, both only a few miles from the job. Western works around the clock. So does Standard. Bob Friman and his men make deliveries 24 hours a day, winter and summer. Western never has equipment down while waiting for deliveries of fuels, lubricants or greases.

Saving No. 2 Western uses only quality products — Standard's Diesel Fuel, STANDARD RED CROWN





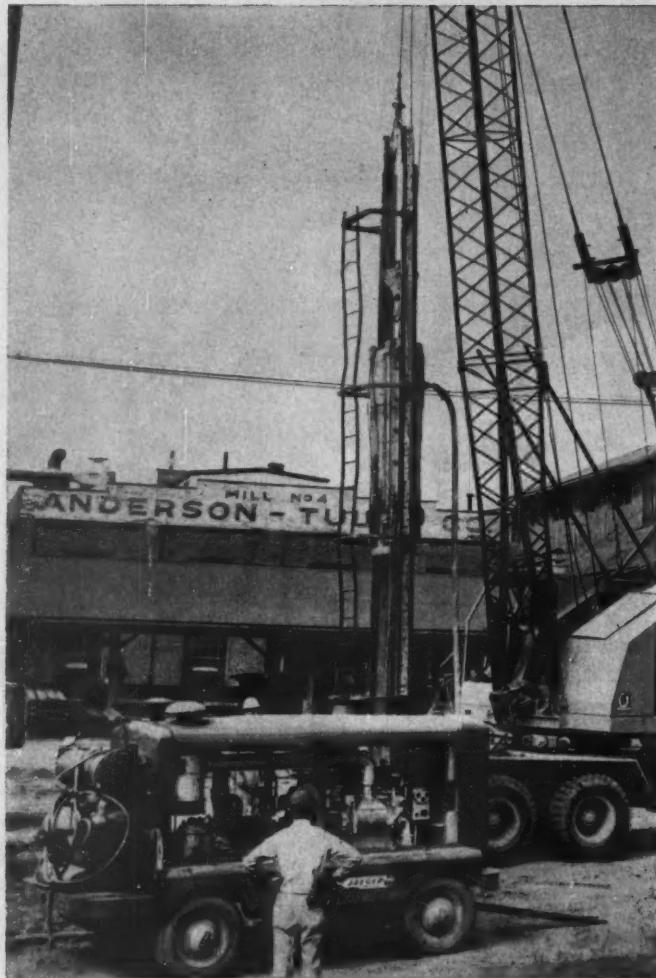
Gasoline, STANOLUBE Motor Oils, AMOCO Lithium Multi-Purpose Grease. With these quality products, equipment is never out of service because of a motor oil or grease failure. Quality products give top level performance over a wider range of conditions. Fewer products do more jobs. This means less inventory, less chance for misapplication, less paper work, less servicing of equipment is needed. Less equipment for handling fuels, lubricants and greases is used, and less lubrication training is required.

A contractor who gets the kind of service Western is receiving on the Oahe Dam job knows he is making savings on the job. You can get such service. Call the Standard Oil office near your job wherever it is in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 30, Illinois.**

Eight years on the job for each of these men—Bob Friman, Red Napple of Standard and Western's general superintendent, A. "Blackie" Blackwell. More than 90 million cubic yards of earth and shale have been moved under Blackwell's supervision. Red Napple, Standard's staff engineer, has been working with contractors such as Western for 13 years. He has an engineering degree from the University of Missouri and, has completed Standard's Sales Engineering School.



*You expect more from STANDARD
and you get it!*



STEADY PRESSURE for McKiernan-Terry 9B-3 Hammer with Jaeger "600".

MORE AND MORE CONTRACTORS
ARE FINDING OUT . . .

AIR COSTS LESS WITH A JAEGER ROTARY

Why do you suppose the men who use Jaeger "600" compressors behind big pile hammers say the Jaeger *"is as smooth as steam"*? Air demand fluctuates violently when you operate a big McKiernan-Terry or Vulcan driver. Jaeger automatic control of engine and compressor is so smooth, so closely regulated, *so instant acting*, that air pressure is held constant under all normal operating conditions. Keeps the tools operating at top efficiency, without over-run, engine racing, wasteful use of fuel.

PAYS OFF ON DRILLING, TOO

The Jaeger "600" also proves its greater efficiency by producing full rated capacity at 100 rpm slower speed than others—1700 rpm instead of 1800 rpm—*using the same GM Diesel 6-71 engine*. You save fuel, save engine and compressor wear every hour you work. More than 500 cf of air per pound of fuel, and often as many as 8,000 hours without a vane replacement, are the proof.

Ask your Jaeger distributor for the cost-saving figures on any size Jaeger Rotary—75 to 900 cfm, or send for new Catalog JC-0.

BELOW: DRILLING SHOT HOLES AHEAD OF BACKHOE
on 10½ mile trenching job for big Eastern steel company's research center. Two Jaeger "600" compressors supplied low-cost air.



THE JAEGER MACHINE CO., 800 Dublin Ave., Columbus 16, Ohio

Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario.

Worldwide sales and service through Jaeger International Corp., Apartado 137, Panama, R. P.

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • CONCRETE SPREADERS • FINISHERS • FINISHER-FLOATS

◀ Circle 31 on Reader Service Card

▲ Circle 32 on Reader Service Card

NEW YORK

thrives on Mack-sized jobs



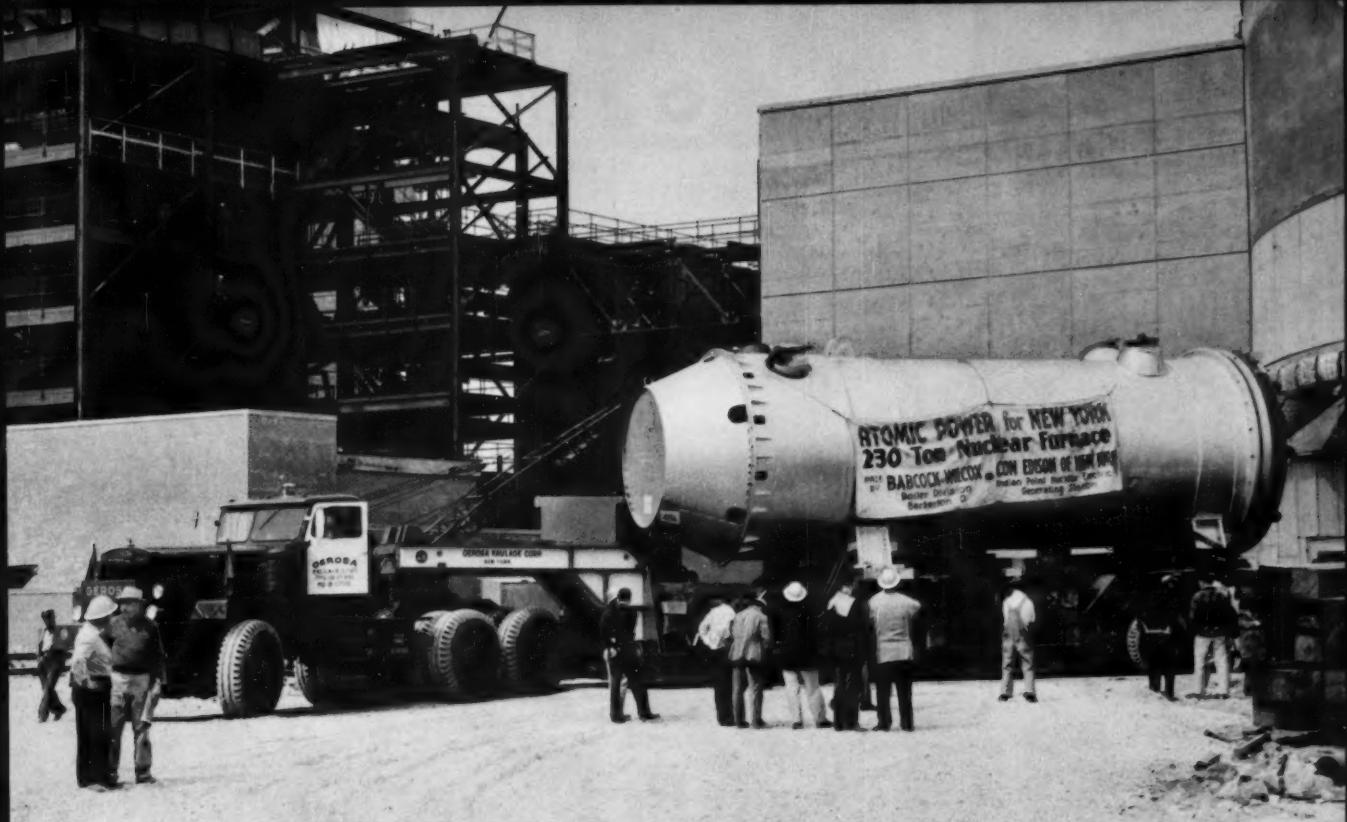
Double-decking the George Washington Bridge



M. J. Torpey, Inc., digs into New York's bedrock to prepare the new Manhattan approach to the George Washington Bridge. Mack dumpers are favorites on this kind of rock job because of their ability to take the day-in, day-out pounding under the shovel and because they have the power and traction for the steep pit pullouts.

The Big City





The world's largest plant to use atomic energy for the production of electricity is nearing completion at Indian Point, a short way up the Hudson from New York City. Consolidated Edison Co. relies on Gerosa Haulage for the experience and know-how to handle heavy tonnage units . . . and Gerosa relies on Macks. Big Mack in picture is hauling the 230-ton nuclear furnace.

keeps growing bigger...

East side, west side, all around the town . . . New York keeps digging, building, growing. Giant new buildings plug the gaps in the skyline—new expressways are carved into the suburbs—a hanging highway crosses the Hudson suspended below a great bridge.

Wherever you turn in New York, the city teems with building activity—and with Mack trucks. Why so many Macks on these jobs? There are plenty of good reasons. For instance, Mack makes a truck that gets jobs done—not just when the going's good, but under *all* conditions. Not just when it's new, but long after other so-called heavy-duty vehicles have outlived their usefulness. A Mack truck can do this because of Mack

Balanced Design . . . the exclusive Mack practice of building its own quality components. Built for Mack trucks alone, they work together with unequaled efficiency and longest life.

Time and again experienced operators have solved the problem of high truck operating costs by turning to quality Mack equipment. Whether to increase your hauling capacity or to take on an unusually tough assignment, there's a Mack model ready to help put more profit in your operation. Your local Mack branch or distributor is the man to see.

and Bigger...

Old hands at the construction of the new expressways smoothing travel between New York City and its expanding suburbs, Tully & DiNapoli, Inc., works its big Mack fleet on numerous jobs throughout the Metropolitan area.



OVER AND UNDER: Mounting traffic problems of New York's northern approaches mean large-scale alterations to Bruckner Blvd. Round-the-clock operations by the Mack fleet of Slattery Contracting Co., Inc., helped keep the big job on schedule.



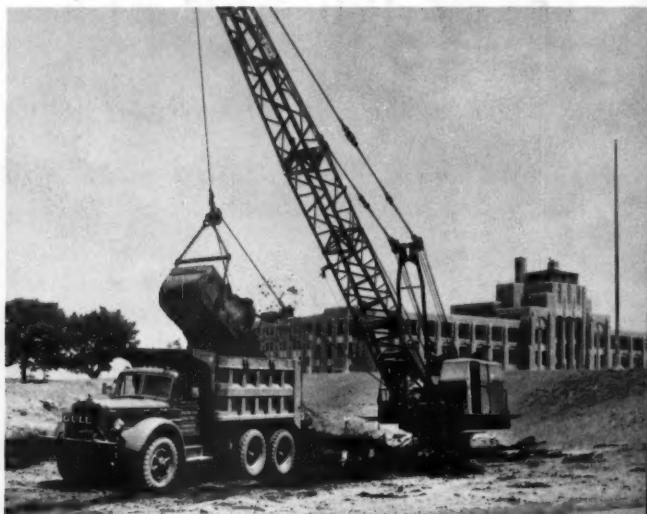
MORE POWER TO N. Y.: Growth of Manhattan's east side brought the need for more power. Thousands of tons of rock were hauled by the Macks of Poirier & McLane Corporation during the construction of this giant generating plant of the Consolidated Edison Co.

and Bigger!

with **MACKS**



NEW BOTTOM: 100,000 motorists a day cross the George Washington Bridge—often get jammed up on it. To help relieve these jams, a new six-lane roadway is being suspended below the existing bridge. Geo. M. Brewster & Son, Inc., one of the major firms at work on the multi-million dollar project, uses Macks on its heavy-duty jobs.



BUILDPUP FOR EDUCATION: Handsome new educational facilities at St. John's University will help take care of New York's ever-growing student population. Gull Contracting Co., Inc., flattens acres of land for new athletic fields with the help of dependable, economical big capacity Mack dumpers.



MACK FIRST NAME FOR **TRUCKS**

Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario

Printed In U.S.A.



7455



Jordan Sellars High School Gymnasium, Burlington, N. C. Unobstructed floor area is 100' by 120'. Height at center of arch is 32'.

Architect: McMinn, Norfleet & Wicker, Greensboro, N. C.

Contractor: O. G. Thompson & Sons, Burlington, N. C.

Manufacturer Precast Units: Arnold Stone Company, Greensboro, N. C.

Ready Mixed Concrete: R. F. Kirkpatrick & Sons, Burlington, N. C.

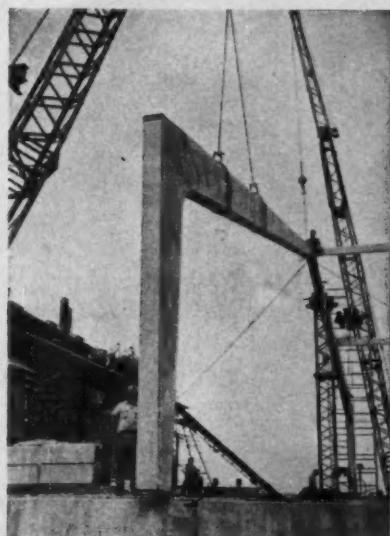
8 PRECAST CONCRETE ARCHES FRAME 100' WIDE GYM

*Lehigh Early Strength Cement
Cuts Casting Time*

Attractiveness, durability, fire safety and unusual simplicity—all characterize the frame of this new gym and further prove the versatility of precast concrete. The huge arches were cast on the gym floor in half sections and raised into position. Precast concrete purlins, spanning 16 feet between arches, provide lateral stability.

For fast re-use of forms in casting both arches and purlins, Arnold Stone Company used concrete made with Lehigh Early Strength Cement. To quote Mr. M. A. Arnold, "Lehigh Early Strength Cement enabled us to complete the casting operations in half the time required with regular portland cement."

This is a typical advantage of Lehigh Early Strength Cement in modern concrete construction. Lehigh Portland Cement Company, Allentown, Pa.



As one crane raised and held the 18-ton arch half, another (on the right) guided it into position. The two halves were then welded together to form complete arch.

**LEHIGH
CEMENTS**

LEHIGH EARLY STRENGTH CEMENT • LEHIGH PORTLAND CEMENT • LEHIGH AIR-ENTRAINING CEMENT • LEHIGH MORTAR CEMENT

◀ Circle 36 on Reader Service Card

FOCUS YOUR LIFTING DOLLARS WHERE THEY'LL WORK THE HARDEST



KOEHRING 545 SPRAWLER, owned by James T. Triplett Inc. of Chester, S. C., eases heavy precast bridge member into place. Machine has pivoting outriggers (see inset) that enables it to outlift its own working weight by 14%. Maximum lifting capacity with outriggers set: 90,000-lbs.

Look to Koehring

Look over the big Koehring lineup of heavy-duty lifting cranes: crawler, Sprawler, truck and Cruiser models. They're heavy duty through and through, built to outlast and outlift other makes for years and years. Here's why . . .

BUSINESS END gives the operator plenty to work with: automatic power boom lowering, power load lowering, pendant boom suspension, boom limit stops, pin-pad boom connection. Makes for faster, safer load lifting and spotting . . . quicker, easier setups.

MAIN MACHINERY delivers smooth, direct power flow. Shafts are driven by cut steel gears, rotate freely on anti-friction bearings. Side stands are line bored in place to keep shafts in perfect alignment.

A MOUNTING FOR EVERY NEED. Self-cleaning, heavy-duty crawlers and rugged truck and cruiser models to meet job requirements . . . deliver maximum load stability with minimum maintenance.

SEVEN CRAWLER MODELS
FROM 10 to 95-TON CAPACITIES

TWO SPRAWLERS
30 and 45-TON CAPACITIES

FIVE TRUCK MODELS
FROM 18 to 55-TON CAPACITIES

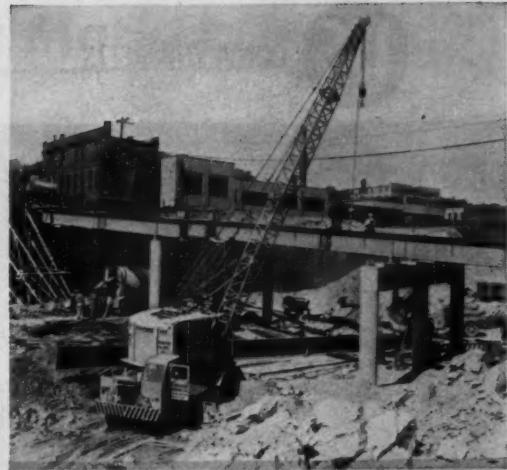
TWO CRUISER CRANES
18 and 25-TON CAPACITIES

See your Koehring distributor . . . or write for a bulletin on the crane of your choice.

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

MORE WORK CAPACITY . . . MORE PROFIT PER DOLLAR INVESTED

Ask your distributor about the 1960 KOEHRING EQUIPMENT SHOW—Waukesha, Wis., Week of Sept. 19th.



Milwaukee Bridge Company's Koehring 305 Truck Crane hoists steel girder for bridge deck. The 305 has a maximum lifting capacity of 25-Tons.



Koehring 605 . . . 36-Ton Crawler . . . pours concrete on Texas Dam project.



Koehring 445 Truck Crane . . . 45-Ton capacity . . . speeds overpass work on highway job. Ramsour Bros., Castle Rock, Colorado is the contractor.



CONVEYOR BELTS

Close-up of screens and roll-crushers and the U. S. Rubber Belts that carry the aggregate to the blending silos or stockpiles.



Standard Industries, Inc. gets more tons per dollar with "U.S." Conveyor Belts

The first U. S. Rubber belt to prove this was installed in 1957. It was Matchless® 30" x 4-ply TN cotton-nylon fabric, $\frac{1}{4}$ " top cover, including special impact breaker with 1/32" bottom cover. It was used on a drive that rapidly wore out ordinary belts. Each "U. S." Belt has lasted an average of 4 times longer in continuous operation, proving that more tons per dollar come from the use of "U. S." Belts.

With this graphic proof of performance, the new

plant of Standard Industries (Tulsa, Okla.) was completely equipped with "U. S." Conveyor Belts in its crushing and loading facilities.

"U. S." Conveyor Belt engineers stand ready to duplicate their "more tons per dollar" service in your plant. Whether you simply require a replacement or would like a complete study of your facilities, you can reach the U. S. Rubber man through your local U. S. Rubber distributor.

Mechanical Goods Division



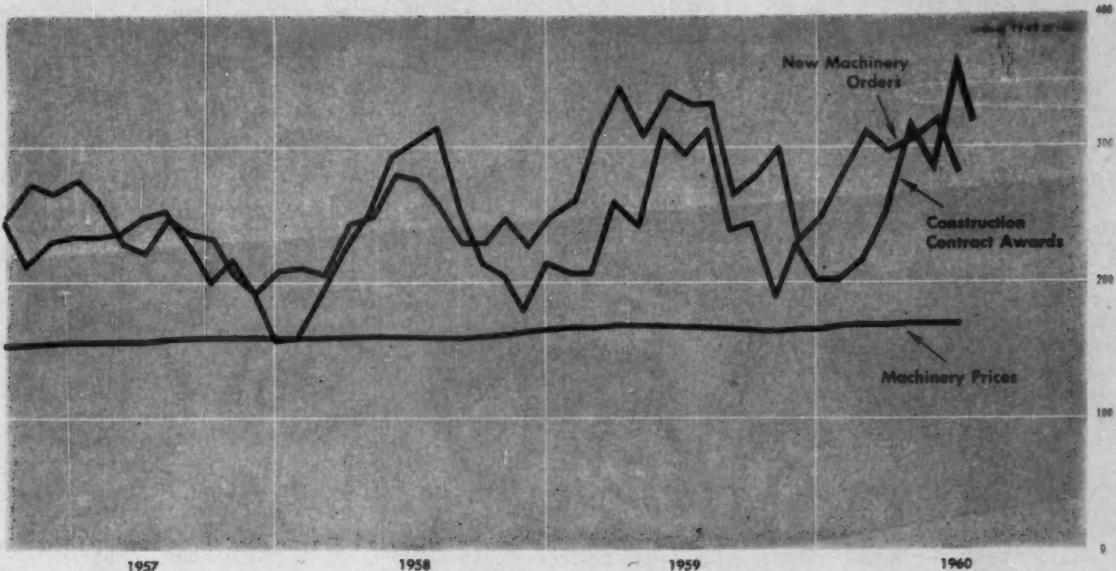
United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.

Trends in the Machinery Market...



Price Index

	JULY 1960	MONTH AGO	YEAR AGO	% CHANGE 1959-1960
All Types of Equipment	175.5	175.3	172.0	+ 2.0
Cranes; Draglines, Shovels	173.4	173.4	168.8	+ 2.7
Shovel, 1/2 cu yd	167.9	167.9	161.3	+ 2.8
Shovel, 3/4 cu yd	175.4	175.4	172.5	+ 1.7
Shovel, 1-1/2 cu yd	188.2	188.2	181.9	+ 3.5
Shovel, 2-2 1/2 cu yd	170.3	170.3	162.1	+ 5.1
Shovel, 3-3 1/2 cu yd	167.8	167.8	167.8	0
Shovel, 6 cu yd	197.9	197.9	190.5	+ 3.9
Crane, truck mounted	168.2	168.2	165.7	+ 1.5
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	162.9	162.9	157.5	+ 3.4
Bucket, dragline	169.3	169.3	169.3	0
Scrapers and Graders	168.8	168.5	165.7	+ 2.0
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	156.8	156.8	156.8	0
Scraper, 2 Wheel, 15-19.5 cu yd (a)	126.2	126.2	123.7	+ 2.0
Grader, heavy duty	174.0	173.7	172.6	+ 0.6
Grader, light & medium	171.1	171.1	171.1	0
Tractors (non-farm, incl industrial)	192.0	181.8	187.8	+ 2.2
Wheel type, off-highway (a)	129.2	129.2	128.2	+ 0.8
Crawler type, 50-74 hp	200.4	200.4	191.9	+ 4.4
75-99 hp	201.2	201.2	196.4	+ 2.4
100-154 hp	197.3	195.3	191.3	+ 2.1
155-200 hp	203.3	203.3	201.3	+ 1.0
Machinery, Tractor Mounted	169.5	169.5	168.8	+ 0.5
Dozer, cable controlled	154.4	154.4	154.4	0
Dozer, hydraulic controlled	186.6	186.6	186.6	0
Cable power control unit	152.9	152.9	151.4	+ 0.9
Loader, tractor shovel	163.2	163.2	161.5	+ 1.0
Specialized Machinery	158.7	157.8	155.7	+ 2.0
Ditcher	153.8	150.2	156.6	+ 1.8
Roller, tandem	226.4	226.4	209.8	+ 7.9
Roller, 3 wheel	178.7	178.7	174.9	+ 2.2
Ripper and rotoer	156.6	156.6	150.5	+ 4.0
Dewatering pump, 90 M gph	111.5	111.5	110.0	+ 1.3
Dewatering pump, 90 M gph	151.5	151.5	150.5	+ 0.6
Portable Air Compressors	167.5	167.5	167.5	0
Contractor's Air Tools	181.8	181.8	181.8	0
Mixers, Pavers, Spreaders	161.8	161.8	156.7	+ 3.3
Mixer, portable, 11 cu ft	166.8	166.8	165.0	+ 1.0
Mixer, portable, 16 cu ft	172.7	172.7	169.8	+ 1.7
Mixer, truck, 6 cu yd	135.1	135.1	132.4	+ 2.0
Mixer, paving, 34 cu ft	196.7	196.7	193.5	+ 1.6
Concrete finisher & spreader	201.9	201.9	190.4	+ 6.0
Bituminous distributor	126.2	126.2	122.3	+ 3.1
Bituminous spreader	179.4	179.4	170.2	+ 5.4
Bituminous paver	165.6	165.6	159.3	+ 4.0
Off-Highway Trucks, Wagons (b)	102.5	102.5	101.1	+ 1.3
Contractor's off-highway truck (b)	102.0	102.0	101.1	+ 0.9
Trailer dump wagon (b)	106.7	106.7	101.4	+ 5.2

• (a) January, 1955 = 100 • (b) January, 1958 = 100
BLS Primary Market Price Indexes, U. S. Department of Labor, 1947-49 = 100

Equipment Orders Drop, But a Few List Prices Are Up

New orders placed with construction equipment manufacturers dropped in June. The Orders Index fell 13% to 276, based on 1949 monthly dollar volume as 100, according to the McGraw-Hill Economics Department. The department computes the index from reports on total orders of reporting manufacturers, each of which is predominantly a construction and mining machinery maker.

New orders slid off even as heavy construction contractors' new business climbed in June. And while July awards slacked off from June's pace, they still set a record rate for the month. The July Contract Award Index was 319, based on 1949's monthly average as 100.

The cutback in July contract awards reported by Construction Methods reflected reduced volumes for mass housing and federal projects. Those declines offset gains in commercial and industrial building, highways, bridges and public nonresidential building awards.

For the first seven months, 1960 heavy construction contracts were 8% ahead of last year and an all-time record for the period. This gain was slightly less than the 9% margin at the end of June.

By contrast, the New Orders Index averaged 5% less than last year's record pace for the first six months.

List prices of new construction equipment continued generally steady through July 15, according to the US Bureau of Labor Statistics price indexes. However, the index is creeping up this year because of scattered price hikes. The July 15 value is a record 175.5, 2% higher than a year ago. Of this rise, 1.5% has come since last December.

Construction Business ...

Heavy Construction Bids Edge Up

Contractors are upping their bid prices on new heavy construction projects—at least in the western states.

This firming up in bids probably reflects two factors: The 1959 depression in bid prices left no margin for absorbing this year's round of substantial wage increases (not to mention the big raises that long-term labor contracts will provide construction workers in 1961 and '62), and this year's upturn in available new business may be making many contractors more confident that they can submit a profitable bid and still win a job.

Two yardsticks signal the turn to high bid prices for heavy construction:

- A 2.1% increase in the first half of 1960 is reported by the San Francisco Corps of Engineers. (Thus the Engineers' semi-annual Contract Unit Price Index retraced most of the drop that came in the first half of '59. And it broke the stability which ruled the second half of that year. The latest value of 180.32 is topped only by the all-time high of 182.02 set in the last half of 1958. (This index is based on bid prices in the first half of 1946 as 100.))
- Irrigation and hydro construction costs ended their decline with a slight rise of 0.8% between April and July. The US Bureau of Reclamation's Composite Cost Index in July, however, was still 1.6% under January and 4% below its record point reached in October '57 and January '58. The July index is 1.25, based on average costs during 1949-51 as 1.0. It covers construction costs in the 17 western states and Alaska.

Canal Construction Costs

Canal construction costs climbed 4.7% between April and July. Costs of constructing laterals and drainage rose 4.1%, according to BuRec's sub-indexes for different types of work. Hydro power plant structure costs moved up 1.6% and pumping plant structures rose 1.4% in latest 3-month period.

By contrast, cost of earth dams weakened further in July. Struc-

tures declined 4.2%, bringing their 6-months drop to 8%. And spillway costs dipped 1.6% in July for a total decline of 4% since January. But these were the only construction categories to show a cost decline during April-July. Though several types had dipped between January and April, most turned up again in July and a few held steady.

Highway Bids Up in West

While heavy construction bids were firming up in the west, contractors' bid prices on new federal-aid highway jobs edged lower in the country as a whole. Prices softened despite the smart recovery in volume of highway and bridge jobs coming up for bids.

The Composite Mile Bid Price Index slipped 0.5% lower in the second quarter, according to the US Bureau of Public Roads. The second quarter value of 159.1, based on average bid prices in 1925-29 as 100, was the lowest

1956—before the interstate highway construction program got underway.

Though a 1.9% rise in average bid prices for common excavation exerted some upward pressure, this was offset by drops of 6.3% in structural steel, 1.7% in reinforcing steel and 4.6% in structural concrete. Pavement concrete bids held steady in the second quarter.

The BPR Composite Mile Index doesn't disclose the trend in highway contractors' bid prices in any particular section of the country. But quarterly price indexes reported by some state highway departments show sharp increases in bids on jobs let by California, Colorado and Nevada in the second quarter.

Commenting on the 14.5% jump in California's index, Assistant State Highway Engineer L. R. Gillis says, "Costs are finally beginning to reflect the actual increases in wages, materials, and

continued on page 47

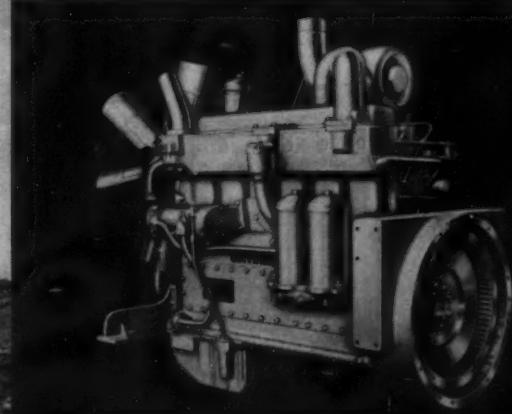
Western States Contract Unit Price Index

**Estimates Section, San Francisco District, Corps of Engineers,
1st Half 1946 = 100**

	1946 1st half	1949 1st half	1957 1st half	1958 1st half	1958 2nd half	1959 1st half	1959 2nd half	1960 1st half
Index, 1st Half '46 = 100	100.0	132.2	170.37	163.07	182.02	176.18	176.58	180.32
Items used in index	Unit							
			Based on these average unit prices					
Cr rock base course.....ton	ton	2.81	2.29	3.41	3.65	2.69	3.35	3.03
Plant mix aggregate.....ton	ton	4.82	4.43	6.92	7.28	6.83	6.97	7.84
Plant mix asphalt.....ton	ton	22.00	26.85	21.50	25.19	23.00	21.00	26.00
Cover aggregate.....ton	ton	5.09	5.65	7.13	7.02	6.96	6.84	6.95
Structural concrete.....cy	cy	50.65	65.07	82.00	79.00	84.00	82.00	82.00
Pavement concrete.....cy	cy	13.20	19.69	23.00	20.00	28.00	22.00	24.00
Reinforcing steel.....cwt	cwt	9.60	12.70	17.00	17.90	18.00	16.00	16.00
Cement.....bbl	bbl	2.84	4.98	5.11	5.00	5.18	4.83	4.87
CM pipe 12".....If	If	2.20	3.03	4.48	4.33	4.52	4.30	4.59
CM pipe 24".....If	If	4.05	5.26	8.04	7.56	7.87	7.97	8.08
RC pipe 18".....If	If	3.50	4.27	6.24	6.38	6.58	6.71	6.87
RC pipe 36".....If	If	8.29	10.47	13.75	12.72	13.20	14.52	14.61
VC pipe 6".....If	If	1.87	2.39	3.70	3.31	3.90	3.67	3.63
VC pipe 8".....If	If	2.22	2.80	3.67	4.01	4.65	4.65	4.46
Sewer manhole.....1/10 ea		16.50	20.80	28.20	27.40	30.00	29.40	27.70
Roadway excavation.....cy		0.67	0.96	1.05	1.09	1.15	2.11	0.97
Structural excavation.....cy		2.49	4.27	5.42	3.78	4.25	4.16	4.62
Watering.....M gal		2.13	2.13	1.92	1.86	1.86	1.85	1.95
Flat wheel roller.....R-hr		5.47	7.82	10.06	11.31	11.00	11.00	14.21
Piling, green wood, fur If	If	0.64	0.65	0.895	1.09	0.88	1.00	0.93
Piling, treated, fur.....If	If	1.25	1.45	2.75	1.77	2.07	2.16	2.07
Timber in place.....100 fmb		16.60	26.33	50.50	39.30	58.30	59.80	52.70
2" Galv steel pipe.....If	If	1.04	1.38	1.62	1.67	1.66	1.40	1.56
Cast-iron pipe 6".....If	If	2.86	4.17	5.42	5.40	6.29	5.05	5.59
Cast-iron pipe 8".....If	If	3.80	6.47	6.07	6.27	7.55	6.03	5.93
Gate valve 6".....1/10 es		7.06	9.70	10.08	11.50	12.10	12.40	10.80
Total in dollars.....		193.65	256.01	328.93	315.79	352.49	341.96	349.19

NEW CAT NO. 14 SERIES C MOTOR GRADER

Compact engine plus many other refinements assure top performance, easier servicing, long life



Important changes make up the new Series C No. 14 Motor Grader—big improvements throughout to give you better performance, long life and servicing ease:

NEW COMPACT 150 HP ENGINE The short, rigid block and stress-relieved crankshaft give greater strength and shock resistance. New cylinder head design resists distortion yet has superior cooling characteristics. Large water pump with cast-iron impeller, ceramic seal face, and carbon type seal combined with a 20 per cent increase in radiator capacity improves cooling, lengthens life.

NEW STARTING ENGINE All-weather starting with this new two-cylinder vertical gasoline engine is assured. Replacing the horizontal engine, this design features aluminum pistons and overhead valves for improved performance. Bore is 2.38", stroke is 2.38", and compression ratio is 8:1. Over-running clutch in starter pinion prevents damage to starter engine when diesel starts, a year-round starting plus.

NEW SERVICING EASE An advanced fuel system is designed for easier servicing and more efficient operation. Compact fuel injection pumps with barrel and plunger assemblies enclosed in housing help reduce wear, lengthen service life.

Plus all the features that made the No. 14B the most versatile motor grader in the "big machine" field . . .

EXCLUSIVE OIL CLUTCH —provides up to 2000 hours of service without adjustment, equal to about a year of "adjustment-free" operation.

DRY-TYPE AIR CLEANER —removes 99.8 per cent of all dirt from intake air. Can be serviced in five minutes.

MECHANICAL CONTROLS —provide easy engagement. "Anti-creep" lock makes blade stay put under load.

FULL VISIBILITY —operator has unobstructed view of job even while seated.

Now, all Cat Motor Graders feature the compact engine. Like the new No. 14C, the 85 HP No. 112E, the 100 HP No. 112F, and the 115 HP No. 12E are all designed to give you the highest production at the lowest possible cost. Your Caterpillar Dealer can give you the facts and figures. He can prove it both on paper and on your job. Call him today.

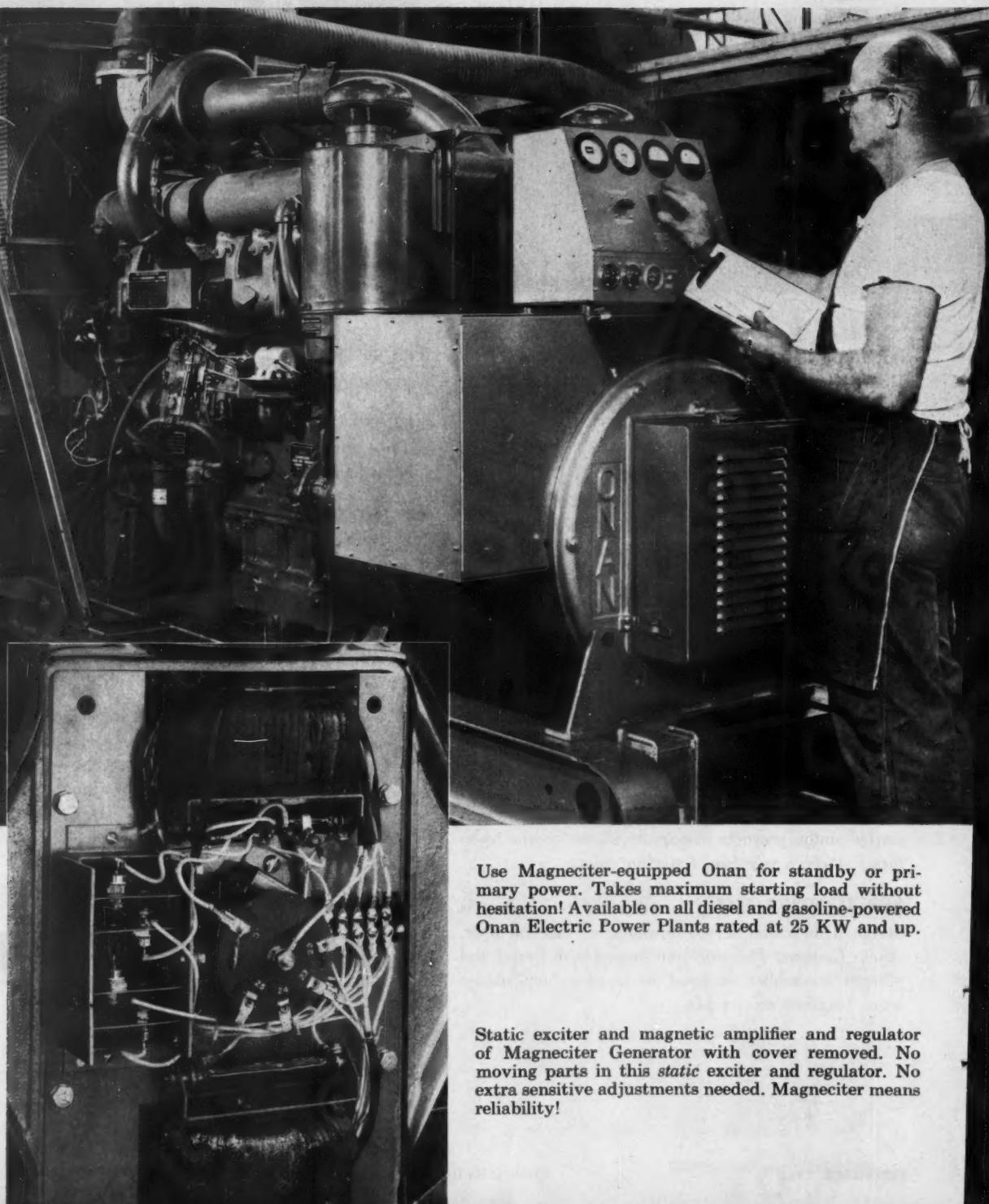
Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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THE NEW NO. 14C
MOTOR GRADER—
MADE FOR THE BIG JOBS

Pour on the load! recovers voltage



Use Magnecliter-equipped Onan for standby or primary power. Takes maximum starting load without hesitation! Available on all diesel and gasoline-powered Onan Electric Power Plants rated at 25 KW and up.

Static exciter and magnetic amplifier and regulator of Magnecliter Generator with cover removed. No moving parts in this static exciter and regulator. No extra sensitive adjustments needed. Magnecliter means reliability!

Onan MagneCiter within 1 second

Even when maximum starting load is applied, Onan MagneCiter gives voltage recovery 5 times as fast as ordinary rotating exciter generator

When a heavy starting load causes a voltage dip, the Onan MagneCiter Generator restores full voltage within one second. Old-fashioned rotating exciter generators take more than five times longer. Furthermore, Onan MagneCiter has no moving parts in its exciter and voltage regulator, thus eliminating hundreds of potential causes of wear.

It's no longer necessary to buy a generator much larger than your normal power needs just to get enough extra power for the heavy drain of starting motors. Onan gives you this margin of power, builds it into every

MagneCiter-equipped Onan Electric Plant.

Every Onan Electric Plant is given hours of running-in and testing under load before it is shipped. An independent testing laboratory retests Onan Plants and certifies Onan testing methods—double assurance that every Onan lives up to its nameplate rating. Only then can Onan qualify for its Performance Certification.

Every Onan is ready to give you long-lasting performance and operating economy. See your Onan representative. You'll find him in the Yellow Pages. Or write direct.

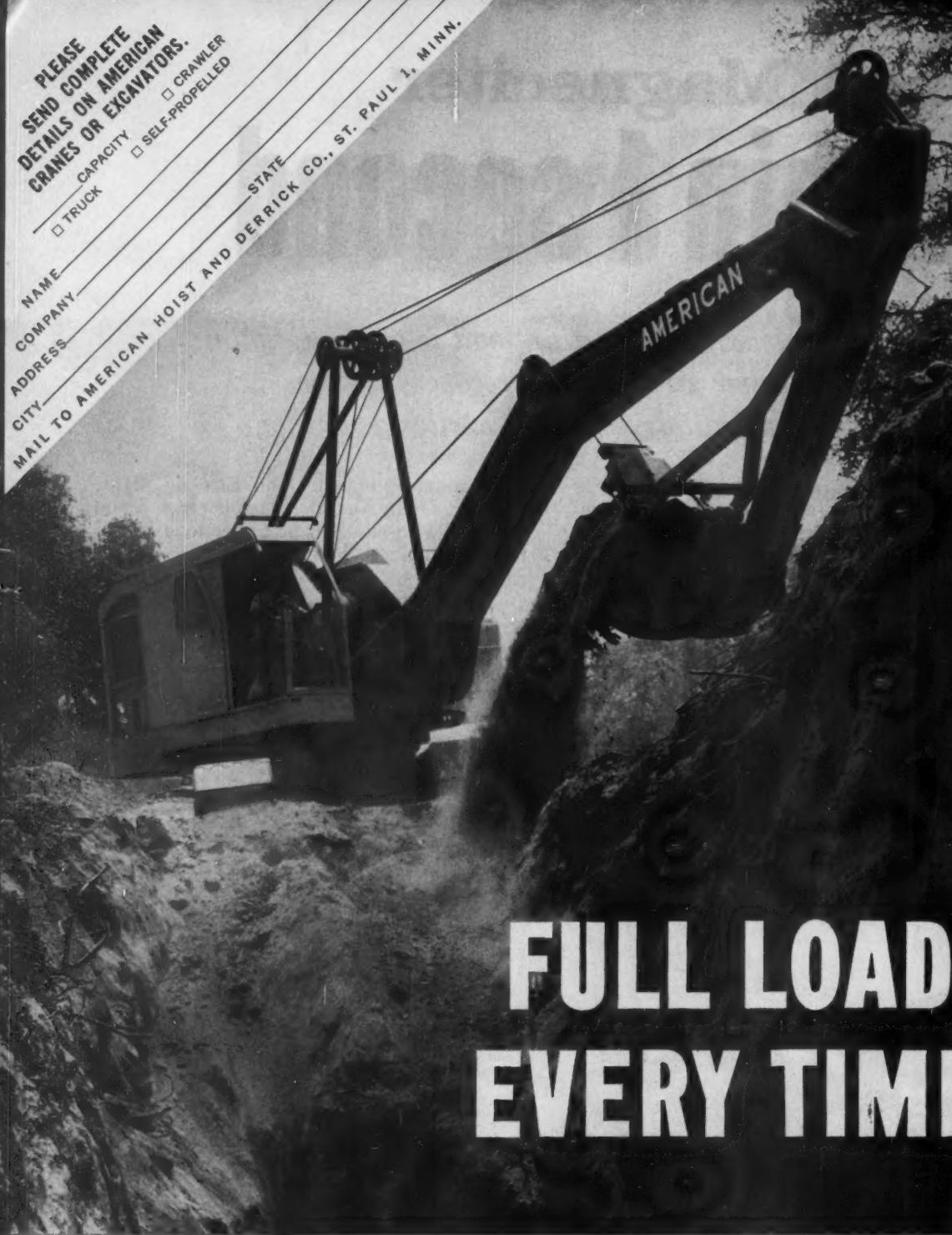
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CROSBY-LAUGHLIN
DIVISION
Forged fittings
for wire rope-chain

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CONSTRUCTION BUSINESS...
continued from page 42

cost of financing which occurred during the last year." Keen competition for new work had been "more than sufficient to offset upward pressures" on costs in late '59 and early '60, according to Mr. Gillis.

Moreover, the big increase in highway lettings in California in the second quarter served to ease competition another way. Bidders per job dropped to 5.8 per project from the 7.5 average in the first quarter. On jobs costing \$1 million or more (20 were let in the April-June quarter), bidders averaged 6.5 per contract compared to 10.5 in quarter.

A 5% rise in highway bid prices in Colorado during the second quarter reflected "a relaxing of the extremely competitive bidding," according to the Department of Highways. Contractors are bidding higher because they are less concerned about the outlook for future contracts in the

Irrigation and Hydro Construction Cost Indexes—July '60

U.S. Bureau of Reclamation, Denver Office. Indexes based on 1949-51 = 1.00

	July	1960	Jan.	% Change	
		Apr.		Apr.- Jul.	7/59- 7/60
COMPOSITE COST INDEX	1.25	1.24	1.27	+ 0.8	- 1.6
DAMS —					
Earth dams	1.07	1.10	1.13	- 2.7	- 4.5
Dam structure	0.91	0.95	0.99	- 4.2	- 8.1
Spillway	1.23	1.25	1.28	- 1.6	- 3.1
Outlet works	1.35	1.35	1.36	0	0
Concrete dams	1.12	1.12	1.14	0	- 0.9
Diversion dams	1.39	1.39	1.39	0	+ 1.5
PUMPING PLANTS —					
Building & Equipment	1.46	1.44	1.48	+ 1.4	- 1.4
Structures & Improvements*	1.31	1.29	1.34	+ 1.8	- 1.5
Equipment	1.71	1.70	1.70	+ 0.6	+ 2.4
STEEL PENSTOCKS, DISC. PIPES	1.78	1.77	1.77	+ 0.6	+ 1.7
CANALS & CONDUITS —					
Canals	1.11	1.06	1.11	+ 4.7	- 0.9
Canal earthwork	1.06	1.01	1.06	+ 5.0	0
Canal structures	1.16	1.12	1.16	+ 3.6	+ 1.8
Conduits (tunnels, concrete-lined)	1.26	1.24	1.26	+ 1.6	- 1.6
LATERALS & DRAINS —					
Lateral earthwork	1.28	1.23	1.28	+ 4.1	- 1.5
Lateral structures	0.97	0.92	0.97	+ 5.4	- 7.6
1.46	1.41	1.46	+ 3.5	- 2.7	
POWER PLANTS, HYDRO —					
Building & Equipment	1.50	1.50	1.52	0	- 1.3
Structures & Improvements*	1.31	1.29	1.34	+ 1.6	- 2.2
Equipment	1.63	1.65	1.65	- 1.2	0
CONCRETE PIPE LINES	1.36	1.36	1.36	0	0
SWITCHYARDS & SUBSTATIONS	1.65	1.53	1.65	+ 1.2	+ 1.2
TRANSMISSION LINES —					
Wood-pole, 115-kv	1.28	1.28	1.25	0	+ 4.1
Poles & fixtures	1.13	1.13	1.12	0	- 2.6
Overhead conductors, devices	1.39	1.39	1.35	0	+ 3.7
Steel-tower, 230-kv	1.48	1.48	1.46	0	+ 2.1
GENERAL PROPERTY (Buildings)	1.41	1.40	1.40	+ 0.7	+ 2.2
ROADS & BRIDGES —					
Primary roads	1.25	1.25	1.25	0	0
Secondary roads (unsurfaced)	1.16	1.17	1.18	- 0.9	- 3.3
Bridges, steel	1.48	1.46	1.48	+ 1.4	0

These indexes are based on the combined cost of material and labor furnished by the contractor and material and labor furnished by the government in 17 western states and Alaska.

* Indexes are based on reinforced concrete structure

BUILD AND MAINTAIN ROADS THE **ROME WAY**



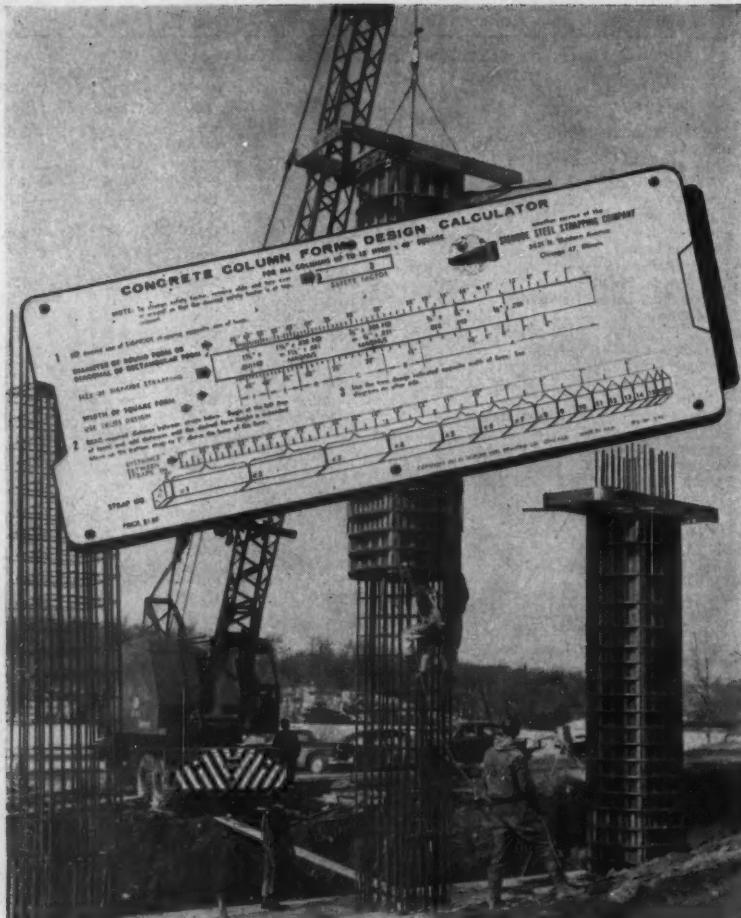
Here's the answer to your problems of mixing, pulverizing and aerating base materials in road construction and maintenance: the new Rome Model TAG Motor Grader Disk Harrow. With 16 disk blades 28" in diameter, the full power and traction of a Caterpillar No. 12 or No. 14 Motor Grader can be used to cut and mix material 7' wide on each pass. Spring-loaded lift links attach to the Motor Grader's blade and scarifier lift arms, giving the operator complete control over the harrow's position and penetration. This new tool is helping contractors to realize substantial savings in both secondary road maintenance and new construction. Your Rome-Caterpillar Dealer has the facts on a complete line of Rome Heavy-Duty Equipment to match your job and equipment. See him now.

ROME PLOW COMPANY, Cedarstown, Georgia, U.S.A.

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Minimize concrete column form costs ...Signode calculator shows how

The cost of designing, building and stripping concrete forms is a large factor in concrete construction costs. Now, you can reduce these costs sharply by using Signode's standardized column form designs. You save in these ways: by using proved simplified form designs; by faster assembly of forms; by faster stripping and less finishing time; by prefabrication in the horizontal; by needing only one man in most cases—Signode tools are designed for a single operator to work efficiently.

Signode's Calculator speeds column form design. It condenses strap size and spacing data for forms up to 65" diagonal or diameter and offers an option of safety factors up to 5. Six tested truss designs are shown.

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CONSTRUCTION BUSINESS... continued

state, in the opinion of the Department, which attributes this change to these reasons: A relaxation of Bureau of Public Roads contract controls and the announcement of a possible increase in federal aid for interstate projects. Helping to improve highway business prospects in the state is the authorization of spending for the Trans-Continental Divide route to Cove Fort, Utah.

Nevada and Idaho

Nevada's highway price index rose 10% in the second quarter to its highest in 18 months. Bid prices rose even though competition for new jobs was apparently more keen than in the first quarter. Average number of bidders per job rose to 6.1, compared to 5 per job in the first quarter. However, two projects costing over \$1 million or more attracted an average of 8.5 bids.

Though Idaho's highway price index held steady in the second quarter, higher average unit prices for five of the nine items used to make up the index were "due to the fact that many contractors had work and, with less competition, were bidding on a more realistic basis. None of the prices were unreasonable," says the highway department. Moreover, a greater proportion of large jobs in the second-quarter lettings probably influenced the drop in bid prices of surfacing materials, as well as serving to hold down increases in other items. Indicative of the easing competitive situation was in the 5.5 per job, compared with 5.9 dip in average number of bidders in the first quarter.

South Dakota

South Dakota also noted a drop in competition as the number of bids declined to 8.2 per second-quarter contract, as against 13.3 in the first quarter. The state let 41 jobs valued at \$12 million in the second quarter; only 9 jobs costing \$3 million in the first quarter. However, South Dakota's bid price index dropped 6% below the first quarter, chiefly because of sharp decline in structural steel bids from their unusually high price average in the first quarter.

contracts awarded on page 51

ENGINEER'S FIELD REPORT



No lost time—No replacement parts with RPM Tractor Roller Lubricant!

Tractor equipment of Gibbons & Reed Construction Co., Salt Lake City, operates in extreme heat, cold, dust and moisture. Yet, despite severe working conditions, track rollers and bearings have given remarkable service using RPM Tractor Roller Lubricant.

"We've used 'RPM' for over 10 years," reports Master Mechanic Harold Higgins. ". . . it has done a fine job, and we've definitely saved on replacement parts. This lubricant seals out dust and moisture to keep bushings in good shape.

We use RPM Tractor Roller Lubricant on over 60 pieces of heavy construction equipment."

Gibbons & Reed is one of Utah's top general contractors with construction jobs throughout Western states. Their maintenance policies are the result of over 25 years field experience. As Harold Higgins says: "You can't meet schedules when equipment is down . . . that's why we rely on 'RPM' to help keep 'em rolling!"

RPM Tractor Roller Lubricant resist wear because it flows evenly to all bearing surfaces, lubricates and retards rust formation. Its special compounds create a tough, wear-resistant film that seals out moisture and dirt.

Why not try RPM Tractor Roller Lubricant? Chances are it can help reduce down time, lengthen equipment life for you. Just call your local representative or write any company listed below:



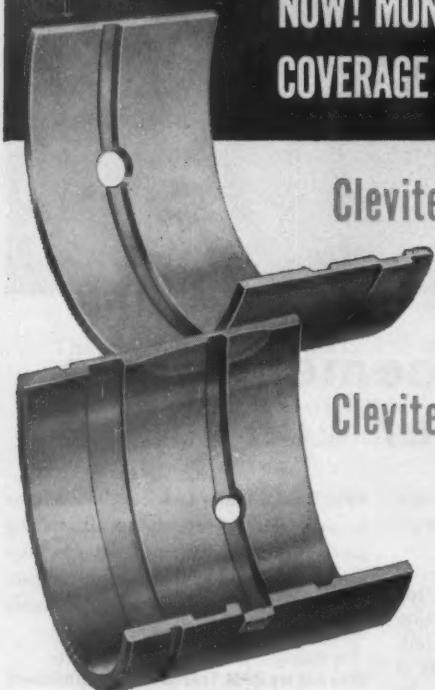
STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

TRADEMARK "RPM" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

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• THE CALIFORNIA COMPANY, Denver, Colorado



NOW! MONMOUTH OFFERS COMPLETE ENGINE BEARING COVERAGE TO THE CONSTRUCTION FIELD



Clevite 77 BEARINGS

CLEVITE 77, with patented cast copper lead tri-metal construction, provides greater load carrying capacity, longer life.

CLEVITE 77 (the bearing preferred by O.E.M.) saves time and money with more hours of service, lower maintenance costs.

Clevite ALUMINUM BEARINGS

Now! A full line of Steel Backed and Solid Aluminum bearings (identical to original equipment in design and materials) is available for **ALL** special earthmoving equipment.

A complete range of undersizes will give you up to four regrinds, extending crankshaft life.

The coverage, availability and service you receive from your NAPA Jobber makes it easy for you to use the best — CLEVITE — from the world's leading original equipment manufacturer.

For your nearest jobber, contact one of the NAPA warehouses listed on opposite page

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Charleston 31, West Virginia

NAPA Charlotte
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Charlotte, North Carolina

NAPA Chicago
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Chicago 16, Illinois

NAPA Cleveland
1458 East 55th Street
Cleveland 3, Ohio

NAPA Columbus
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Columbus 8, Ohio

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SOME BIG CONTRACT AWARDS OF THE MONTH

Merritt-Chapman & Scott Corp., and **Raymond International, Inc.**, both of New York, N.Y., **Tidewater Construction Corp.**, Norfolk, Va., **Peter Kiewit Sons' Co.**, Omaha, Neb. A joint venture to construct the **Chesapeake Bay Bridge-Tunnel Project** between Little Creek and Kiptopeake, Va. **Chesapeake Bay Ferry District Commission**, Box 120, Norfolk, Va. \$116,535,462.

Diesel Construction Co., New York, N.Y. Erect a 50-story, 2,000-room, concrete frame hotel at 7th Ave. and 52nd St. in New York City. **Loew's Theatres, Inc.** 1540 Broadway. \$50,000,000.

Daniel Construction Co., Inc., Greenville, S.C. Construct a manufacturing plant in Kingsport, Tenn. **American - Sanit - Gobain Corp.**, 625 Madison Ave., New York, N.Y. \$40,000,000.

Hirano Brothers, Honolulu, Hawaii. Construct 1,500 homes at the Pacific Palisades subdivision of the Pearl City development project. **Lewers & Cooke**, 404 Piikoi St., Honolulu. \$30,000,000.

Beacon Construction Co., Allston, Mass., and **John A. Volpe Construction Co.**, both of Malden, Mass. Erect Capehart housing units at Fort Devens in Ayer, Mass. **Corps of Engineers**, 424 Trapelo Rd., Waltham. \$18,857,030.

Guy F. Atkinson Co., San Francisco, Calif. Construct 7.4 mi of eight lane San Diego Freeway near Valley Vista Blvd. in Los Angeles County. **State Division of Highways**, 120 S. Spring St., Los Angeles, Calif. \$16,237,675.

Arthur G. McKee & Co., Cleveland, Ohio. Construct a rocket and fuel plant in Saltville, Va., Dept. of the Air Force, Pentagon, Washington, D.C. \$15,000,000.

Peter Kiewit Sons' Co., Omaha, Neb. Construct the main section of the Carmen-Smith Hydroelectric Project on the Upper McKenzie River near Eugene, Oregon. **Eugene Water and Electric Board**, Box 1112, Eugene. \$14,798,170.

Arthur Venneri Co., Westfield, N.J. Construct a housing project

4500 SQ. FT. PER HOUR ... THAT'S TAMPING, BROTHER!

That's tamping that packs profit into paving jobs! These **STOW** tampers work faster, more efficiently, compacting granular soil in trenching, backfill, sub-bases, foundations. Perfect for blacktopping and pavement patching, too!



Here's why:

- **WALLOP:** precision engineered to coordinate the engine and vibrator strokes for a 2200 lb. tamping impact.
- **SPEED:** designed to propel itself at speeds up to 50 ft. per minute—tamping 4500 sq. ft. per hour.
- **TROUBLE FREE:** powered by a Wisconsin easy-start engine with a special fuel pump to operate the engine at any angle.
- **RUGGED DESIGN:** with heavy-duty components, and a gas tank mounted under the engine for less wear and tear.

Call your nearest Stow distributor for an on-the-job demonstration. Or send in the coupon below.

STOW MANUFACTURING CO. 31 Shear St., Binghamton, N.Y.

STOW MANUFACTURING CO.

Dept. M-2, 31 Shear Street

Binghamton, New York

Please send me Tamper Bulletin 593.

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COMPANY _____

STREET _____

CITY _____ STATE _____

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Your **NAPA** Jobber
is a Good Man to Know!

Fall...

*now is the time to properly
light your construction hazards*

USE THE
DIETZ
3
WAY
HAZARD WARNING
SYSTEM



LANTERS TORCHES VISI-FLASH

Use Dietz Visi-Flash Lights to alert the on-coming driver. Brightest, safest, most trouble-free flashers on the market. Warn: "Danger Ahead" for up to 1500 hours without changing batteries.

Use Dietz Lanterns to locate hazard in relation to driver's position. Show exact location, shape, extent, and boundaries of hazard area. Burn up to 100 hours.

Use Dietz Torches to guide driver around the hazard. Fully illuminate the danger in every weather. Burn up to 48 hours on low cost kerosene.

Go DIETZ
and you go Safely

**It's Fall . . . shorter
days . . . still lots
of traffic!**

Proper lighting of the highway hazard is an essential investment to protect the public, workers, and equipment, and to eliminate potential causes of costly lawsuits.

NEW! DIETZ **HAZARD WARNING** **PLANNER**

A Practical On-the-Job Tool! Quickly and easily shows how, when, and where to use each type of warning light for maximum safety under all weather conditions and all types of roads and speeds.



R. E. DIETZ COMPANY

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Syracuse 1, N. Y.

Send \$1.
for each Planner —
personalized with your name

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CONTRACTS AWARDED . . . *continued*

in Newark, N.J. City Housing Authority, 75 Sussex St., Newark. \$14,179,675.

Contracting & Materials Co., Evanston, Ill., **Kenny Construction Co.,** Chicago, Ill., and **Foster Marsch Corp.,** San Diego, Calif. A joint venture to construct 32.5 mi of aqueduct from Pardee Dam to Walnut Creek in Oakland, Calif. East Bay Municipal Utility Dist., 2130 Adeline St., Oakland. \$14,028,292.

S. S. Silberblatt, Inc., New York, N.Y. Construct 800 Capehart housing units at Fort Leonard Wood, Mo. Corps of Engineers, 1800 Federal Office Building, Kansas City, Mo. \$12,557,950.

Lane Construction Co., Meridan, Conn. Construct waste weir and outlet channels for the Cannonsville Dam near Liberty, New York. Board of Water Supply, 120 Wall St., New York City. \$11,695,000.

Robert E. McKee, Inc., Los Angeles, Calif. Erect two building additions for the Harbor General Hospital in Los Angeles. Board of Supervisors, 501 Hall of Records. \$11,584,950.

G. F. Atkinson Co., San Francisco, Calif. Construct floating portion of second Lake Washington Bridge at Seattle, Wash. State Toll Bridge Authority, Transportation Bldg., Olympia. \$10,969,596.

Berlanti Construction Co., Inc., and **Zazzarino Construction Co., Inc.** both of Harrison, N.Y. Construct reinforced concrete roadway and bridge structures for the Bruckner Expressway in New York City. State Dept. of Public Works, State Office Building, Albany. \$10,377,681.

Gust K. Newburg Construction Co., Miami, Fla. Erect a newspaper plant in Miami. Miami Herald Publishing Co., 200 S. Miami Ave. \$10,000,000.

Turner Construction Co., New York, N.Y. Construct a 16-story office building at 27th and Madison Ave. in New York City. New York Life Insurance Co., 51 Madison Ave., \$8,000,000.

MANITOWOC 4500 VICON*

the only *really new* excavator design since steam!



The Manitowoc Model 4500 VICON represents the most outstanding advancement of excavator design in decades. Here is a 6 yard shovel or 7 yard dragline incorporating new, tested design principles to give you more yardage in less time than any other mechanical or electrically driven shovel-drag in this size range. Thoroughly proved on the job for over three years, VICON design has increased yardage 25% or better, substantially reduced maintenance costs, and piled up more profits for owners. Some exclusive VICON features are:

INTEGRATED CONTROLS that serve both as clutch operating levers and as engine throttles, providing variable speed control over each function. Clutches, being responsive to lower range of control pressures, are engaged before engines are accelerated. Slippage and overheated friction surfaces are eliminated, lengthening clutch life appreciably.

HOIST AND DRAG DRUMS ARE INTERLOCKED to automatically synchronize their operation. Cycle time is faster and output is greater because full horsepower is always available for hoist—the operator doesn't "soak" it up with the drag brakes. Operating costs are noticeably less because brake use is cut by 50%.

and lining wear is drastically reduced. Another advantage of the VICON interlocked drum arrangement is that the operator can "power lower" or free-cast the bucket.

DUAL INDEPENDENT ENGINE POWER with one engine powering the main drums, and the second all other functions. Here are all the advantages of electric or conventional diesel engine mechanical drive without the disadvantages of each. You get the performance characteristics of electric drive—smoother power flow, variable independent speed control, simultaneous operation of dig, hoist, swing, and propel functions—without sacrificing mobility, without incurring the headaches and special maintenance problems of electric drive, without needing a separate power source at every job site. You get the simplicity of mechanical drive without losing valuable production time because of engine "lug down", without needing to jam clutches into engagement at high and harmful engine speeds, without the limitations of operating speeds that are inherent in conventional diesel engine drive.

Why not get the complete story on the *sensational* Model 4500 VICON today? Your nearby Manitowoc distributor has all the facts.

8-A * Variable Independent Control



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SHOVELS
1 1/4 — 6 YDS.

CRANES
25 — 125 TONS

DRAGLINES
1 1/4 — 7 YDS.

TRENCH HOES
1 1/4 — 3 YDS.

Another Standard Equipment "EXTRA" from GAR WOOD-BUCKEYE...



GAR WOOD-ST. PAUL TRUCK EQUIPMENT, with precision hydraulics system, handles controlled dumping smoothly and quickly. It's the most complete line of arm-type, under-body and front-mounted telescopic hoists, with matching bodies.



GAR WOOD TRACTOR EQUIPMENT, matched to rugged Euclid tractors, insures trouble-free performance under the biggest loads. Equipment includes Tipdozers, Dozecasters, Rippers and front- and rear-mounted cable control units.



HI-LO TRACTION SHIFT

Speeds Ditching...Cuts Fuel Costs

Only the Gar Wood-Buckeye 407 general utility ditcher has the exclusive Hi-Lo traction shift that permits forward or reverse digging speed to be instantly increased or reduced 50% without disengaging the main engine clutch. Hi-Lo shift simplifies speed selection, reduces fuel consumption, provides instantaneous adjustments to digging and traction conditions and simplifies matching crawler speeds to depth of cut.

There's a long list of standard equipment "extras" you Gar Wood-Buckeye dealer can show you to prove the superior performance of the 407... "live" hydraulic boom crowd, push button conveyor shift, greater speed range without sprocket changes, two speed conveyor and non-reach grouped controls. Why not get the complete story on Gar Wood-Buckeye standard equipment "extras"... soon.



GAR WOOD TRUCK CRANES deliver a smooth flow of precision controlled power. Advanced, high-performance features let you do more kinds of jobs...faster...more accurately...at lower cost.

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How protection in depth helps cut compensation costs



Reducing accidents by filming the hazards

Sound slide films are great for teaching people. Like teaching safe practices to workers, from welders to sales clerks, from machinists to loggers. More than 500 such training films have already been produced by Liberty Mutual to help policyholders reduce on-the-job accidents and losses. Each film is custom made, using policyholder personnel and facilities in the pictures. This is but one of the many Liberty Mutual services that add up to protection in depth. For more facts about Liberty's protection in depth and how it can help you lower your business insurance costs, get in touch with your nearest Liberty Mutual office.

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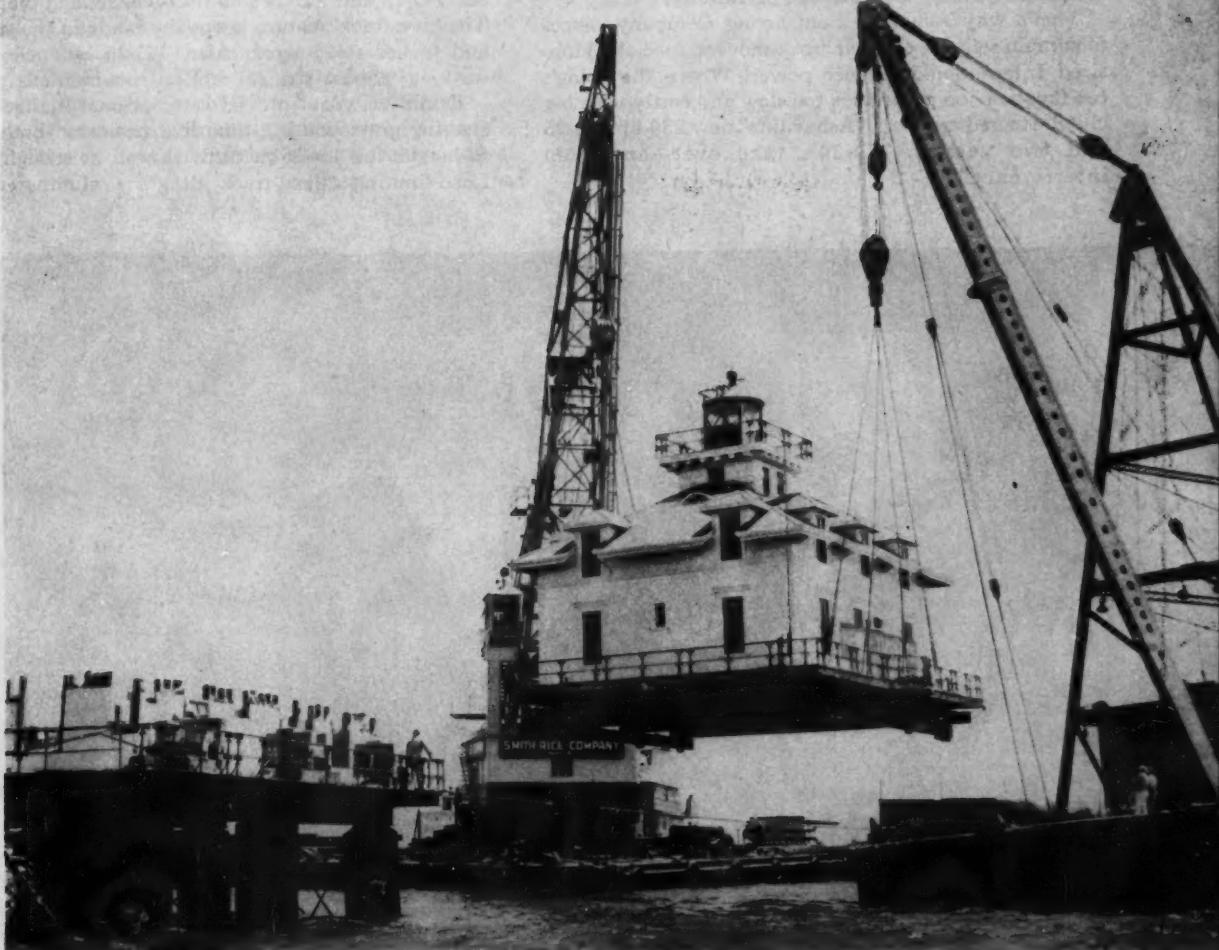
Business Insurance: Workmen's Compensation, Liability, Group Accident and Health, Fire, Fleet, Crime • Personal Insurance: Automobile, Fire, Inland Marine, Burglary, Homeowners'

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Lighthouse Takes Ride Up the River

PICTURE
OF THE
MONTH



• Two floating derricks, with a combined capacity of 180 tons, lift a 37x43-ft, two-story lighthouse from its piers onto a deck scow. The derricks belong to the Smith-Rice Co. of San Francisco. The 55-yr-old Southampton Lighthouse, in San Francisco Bay, will be replaced by a self-contained light. Healy-Tibbitts Construction Co. of San Francisco is handling the job for the U. S. Coast Guard. The old building will be floated up the San Joaquin River on the scow by the Crowley Launch & Tugboat Co. to Tinsey Island, where the St. Francis Yacht Club plans to convert it into a clubhouse.

"'Live track' power steering rock...SO WE KEEP OUR TD-25

—Asheville Contracting Company,

Shale and blue granite rock make up 85% of the 550,000-cu. yd. of roadway excavation on this contract —5.18 miles of Blue Ridge Parkway construction, for the United States Department of Interior.

That's why Asheville Contracting Company places maximum reliance on their "rock-movers' special": king-sized International crawler power! Where the going's too tough or job progress is too slow and costly with big clutch-steered crawlers, "Asheville's" new 230-hp TD-25 and two veteran TD-24's take over—and "run interference."

"International 'live track' power steering moves more dirt and rock," states M. H. Reighard, Superintendent of rock operations for "Asheville." "Therefore, we keep our TD-25 and TD-24's on trail-blazing and pioneering. The 'live track' feature keeps the blade in the material and makes steep work safer. TD-25 balance enables working 'almost straight up' on mountainous terrain."

Exclusive, years'-proved International Planet Power-steering gives you full-time live power on both tracks to handle full loads on turns as well as straightaways. Load-limiting "dead-track drag" is eliminated. And



moves more PIONEERING"

Asheville, No. Carolina

"live track" power-steering is combined with on-the-go, Hi-Lo power-shifting that lets you match power to load instantly, for full-speed cycles. You do away with time-wasting "gear-shift lag!"

New TD-25 seven-roller tracks are strength-matched to the full effort of the high-torque, 230-hp turbocharged Diesel engine! The "25" is platformed on shock-resistant, double-box-beam track frames—smoothly carried on International's dual-protected Dura-Rollers, the track rollers that make 1,000-hr. lube intervals practical!



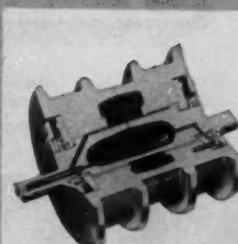
As standard equipment at no extra cost, the TD-25 gives you exclusive, combined Planet Power-steering and Hi-Lo on-the-go power-shifting. And you get this work-speeding design advantage in torque-converter or direct drive model. Here, Asheville's "25" operator is ready to "shift-up" to keep the load on the move.



Power-steer and power-shift the TD-25 with king-sized loads—around curves, upgrade, anywhere! Compare planet-powered "25" ability to deliver full-load capacity, full-time—to outearn other big rigs up to 50%—blading rock, benching, push-loading, mass-production dozing (where fast reverse and decelerator action count), ripping shale! Let your International Construction Equipment Distributor demonstrate!

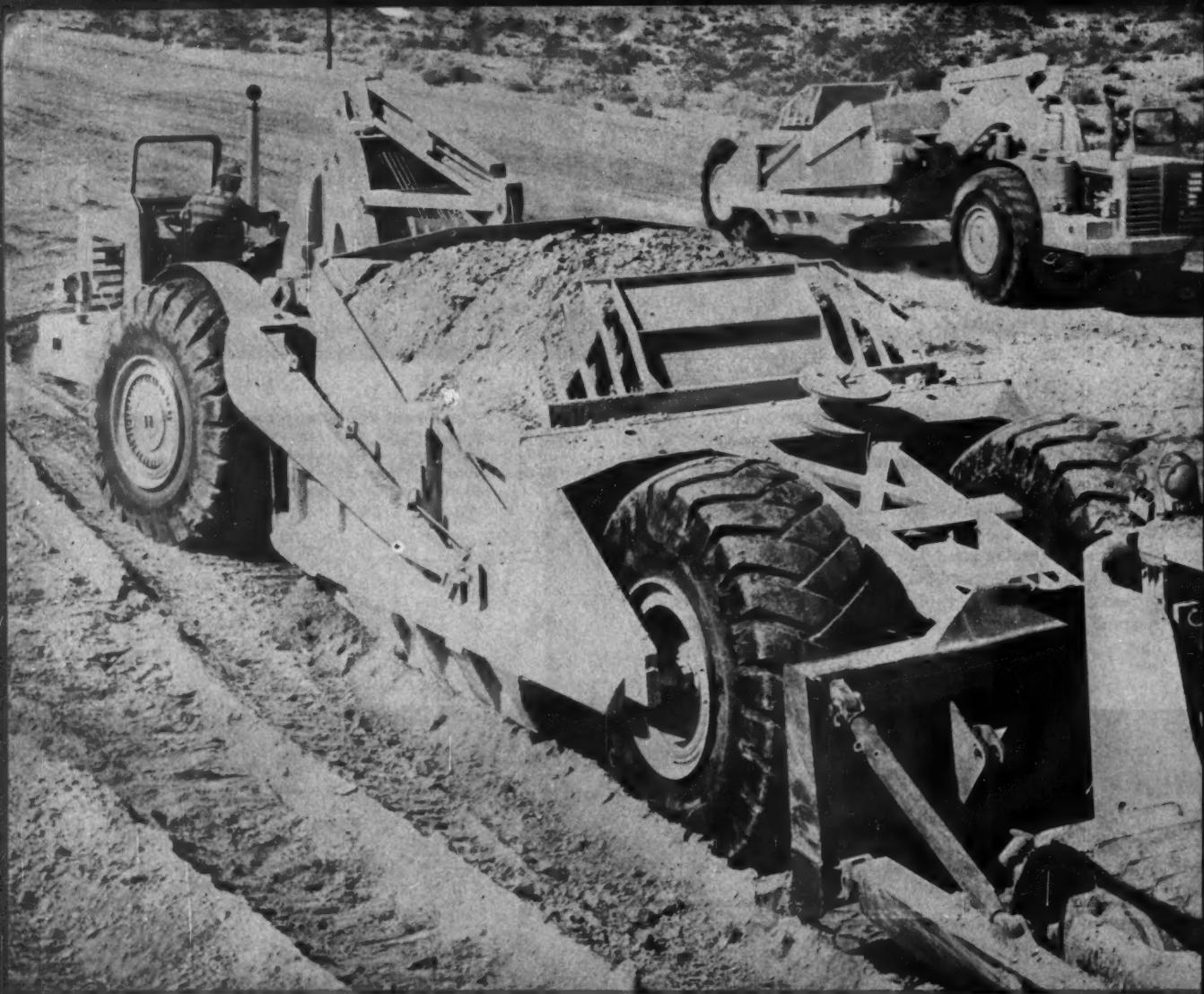
Even with an enormous offset load of shot-rock there's no "bank-nosing;" no sluing. The TD-25 operator simply operates the load-side track in high-speed range—the other track in low-speed range. Result: full-capacity, straight-ahead performance—the same as the "25" gives on benching, bank-cutting, or side-casting!

Heavy-duty TD-25 Dura-Rollers feature thick, deflection-proof shells; full-floating, precision fitted seals; king-sized lube reservoirs; and exclusive pressure-relief passages that protect seals from overlubrication. These minimum-maintenance track rollers give you practical 1,000-hr. lubrication intervals!



**International
Construction
Equipment**

International Harvester Co.,
150 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

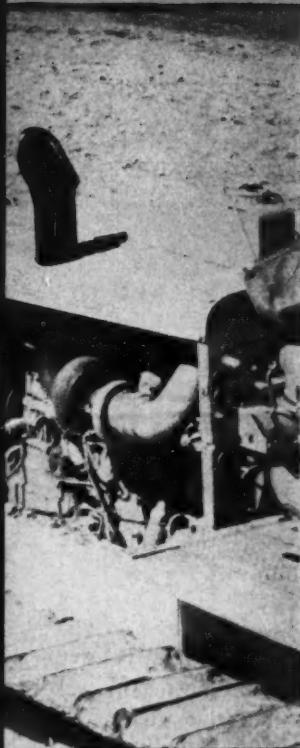


With the planet-powered 230-hp TD-25 pushing—and with 375 high-torque International Diesel hp under the "295's" hood—you heap on 34-cu. yd. with amazing new speed. Even in toughest loading conditions, "X"-member reinforcing maintains perfect Payscraper push-frame alignment!

Note that the Payscraper apron lifts to a big 94-inch opening. Two ejector-plate pushing members apply dozer-like action to force out the whole 34-cu. yd. load cleanly. The 122-inch bowl width speeds unloading, and loading, too—adds control ease and stability, loaded or empty.



How Payscraper power and power controls boost your dirt-on-fill delivery!



You get highest power-to-payload punch of all rubber-tired rigs in the 34-cu. yd. International 295 Payscraper. The fast-slugging, high-torque 6-cylinder International DT-817 Diesel is the Payscraper power plant.

The direct-start, 375-hp DT-817 is turbocharged to give you all-altitude, high-efficiency performance—power for cycle-speeding rim-pull—plus time-saving “no-lag” control power!

You power-shift the Payscraper, up or down—and the 4-speed planetary-type, torque-converter transmission provides load-speeding *automatic* direct-drive lock-ups in second, third, and fourth gears!

You power-steer the 150,000-lb. loaded Payscraper almost as easily as a 3,600-lb. automobile. Payscraper gives you the big control advantages of (1), exclusive International rack-and-pinion plus tandem pump steering system; and (2), 3-degree forward spindle pitch that

improves scraper balance and prevents “nose-downs” in high-speed turns!

You power-control Payscraper dirt-handling actions with fingertip ease with the International PTO-driven Cable Control Unit. One cable drum of this simple planetary system actuates the apron and ejector; the other drum positions the bowl to control loading and spreading! Reach-easy Payscraper power brakes give you fast, positive stopping!

Ease into the bump-smothering Payscraper seat—press the direct-start button—power-shift the outfit into action. Compare the speed of loading, roading, and dumping the 122-inch bowl. See how the advantages of DT-817 Diesel power and complete, positive Payscraper power control can boost your dirt-on-fill delivery. Choose the 2-axle “295,” or 3-axle, 34-cu. yd. “495.” See your International Construction Equipment Distributor for a demonstration!



Here's your 76-page cost and production estimating book—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combination for top profits, anywhere! See your International Construction Equipment Distributor!



**International®
Construction
Equipment**

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

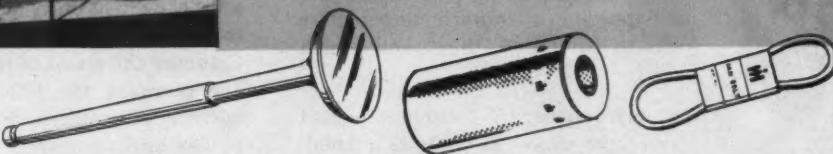
Positive power-control of all operations adds safety, builds operator confidence—makes him “haul-speed minded” to help you get full capacity and profit from Payscraper speeds up to 33.5 mph. For example, safe, effortless tandem-pump power-steering leaves “the steering feel in the steering wheel”—gives positive, one-hand control!



You get peak production here



because IH parts are here



Protect and renew original performance with genuine IH replacements!

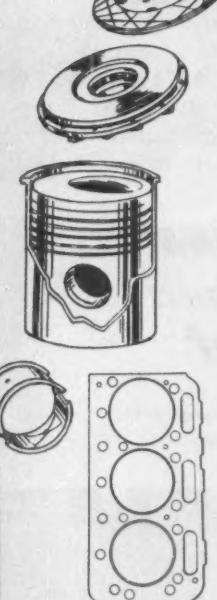
No matter how work-scarred your International equipment looks, it's performance that counts—and...you can renew that performance, time and again, after thousands upon thousands of profitable working hours with genuine International parts.

Keeping component life and dependability balanced is a big factor in getting continuing peak performance and low costs! That means replacing work-worn parts with the only parts that have the original engineered *fit-and-fitness*. So...when it comes to parts, demand genuine International replacements.

An International crankshaft, for instance, is Tocco-hardened, has tri-metal bearings. International pistons have high quality steel alloy construction for maximum heat disper-

sion. Tri-metal rod bearings and centrifugally cast sleeves assure longer wear. Valves, guides and gaskets are precision machined and tested to exact International specifications. Fuel and cooling system components—fan belts, radiator, thermostats, injectors, pump parts—are all held to strict International standards.

In short, every International part is a product of maximum quality control—an identical twin of the part it replaces—and will give you finest all-around performance for the longest period of time. So stick with International parts for your International equipment—they fit better, work better, wear better, and are most economical.



International parts and service facilities are always nearby, with a network of 12 parts depots and more than 200 distributor outlets. You get the part you want, when you want it!



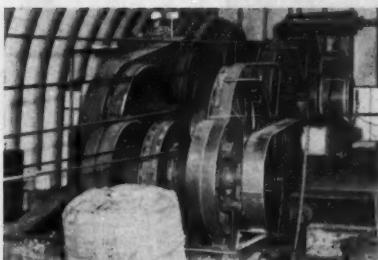
International® Construction Equipment

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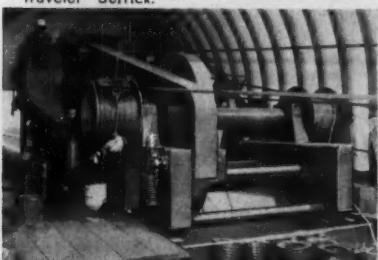
A 42,000 line pull Clyde Hoist handles a 125 ton pick for Harris Structural Steel Co., Inc., on the Bronx approach of Throgs Neck Bridge. A second Frame-12 Clyde Hoist operates traveler derrick for lifts on higher piers.

HARRIS BUILDS BRONX APPROACH OF THROGS NECK BRIDGE WITH CLYDE



Barge mounted Clyde Hoist equipped with pony drums for vang line slewing.

Clyde hoist and swinger operating traveler derrick.



MEN AND MACHINES combine to accomplish difficult construction to serve man's needs. But it takes highly skilled and experienced manpower and specialized and dependable machines! Harris' use of two Clyde Frame-12 Hoists for the erection of the Bronx approach provided just such an effective combination!

CLYDE'S 'PLUS' FEATURES are many and varied. Two outstanding features that assure fast, safe spotting are Clyde's large diameter brakes and internal expanding band friction clutches. Both are extremely smooth in engagement and release . . . both are Clyde advantages born of over 60 years of experience in building the finest hoists made. Clyde Hoists have all steel bed and side frames, high strength spur gears, over-size anti-friction bearings . . . but why go on? The money-making, money-saving features of Clyde Hoists are endless. Why not write for Bulletin 34 and study the specs on Clyde's complete line of Hoists? There is no obligation.

**"Quality is Always Foremost
in Clyde Hoists"**



CLYDE IRON WORKS, Inc.

Established 1899
DULUTH, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : BUILDERS TOWERS
UNLOADERS : CAR PULLERS : ROLLERS

"Shear-Ball" connection eliminates adjustments, boosts output



year after year. There are no center pins, center pin nuts, centering gudgeons, rollers, bushings, exposed roller paths to be lubricated and adjusted frequently. Even in constant rock digging there is no bounce or wobble.

10-year warranty. "Shear-Ball" has proven so reliable in ten years of field use on many hundreds of machines that Lorain now warrants the "Shear-Ball" for 10 years against failure to function in normal use and service.

In this unique design a single row of balls holds turntable to mounting — allows it to revolve smoothly, freely, steadily, year after year. There are no center pins, center pin nuts, centering gudgeons, rollers, bushings, exposed roller paths to be lubricated and adjusted frequently. Even in constant rock digging there is no bounce or wobble.

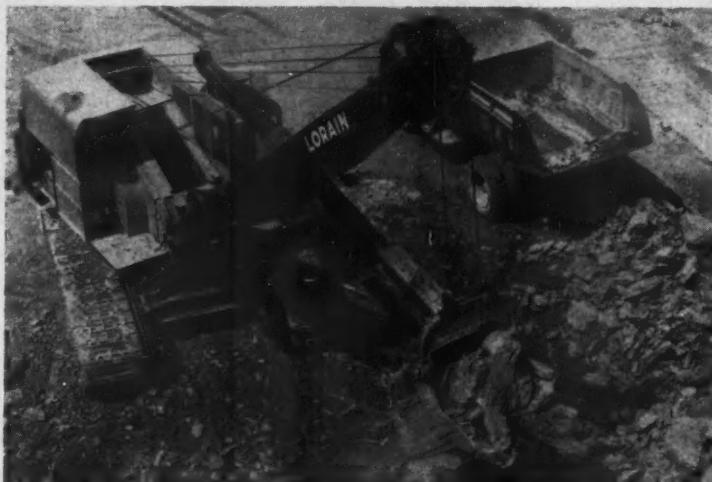
Contractors report: "During two years of operation we never touched 'Shear-Ball' mountings except to lubricate them. Yet our other hook roller and center-pin types have been in the shop for new rollers, bushings and pins."

"As far as maintenance is concerned, there is no comparison between 'Shear-Ball' and any other type of mountings . . . before 'Shear-Ball' we spent \$7,000 to \$8,000 for rollers, bushings and cracked frames."

"The single ball race design gives us a more compact machine to get under lower bridges."

You too can have this kind of performance. See your Lorain shovel and crane distributor or write direct and ask for the "Shear-Ball" booklet that gives a full explanation of this unique feature.

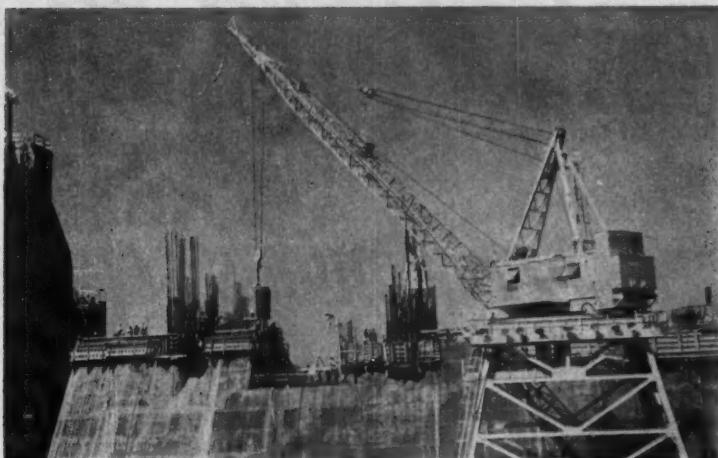
THE THEW SHOVEL COMPANY, LORAIN, OHIO



LORAIN. ON THE MOVE

PLANTS: In Lorain, Elyria and Bucyrus, Ohio . . . **PRODUCTS:** Power shovels, draglines, clamshell, and hoes from $\frac{1}{2}$ -yard to $2\frac{1}{2}$ -yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . **OUTLETS:** Lorain products are sold and serviced by 249 distributor outlets throughout the world.

Construction News in Pictures . . .

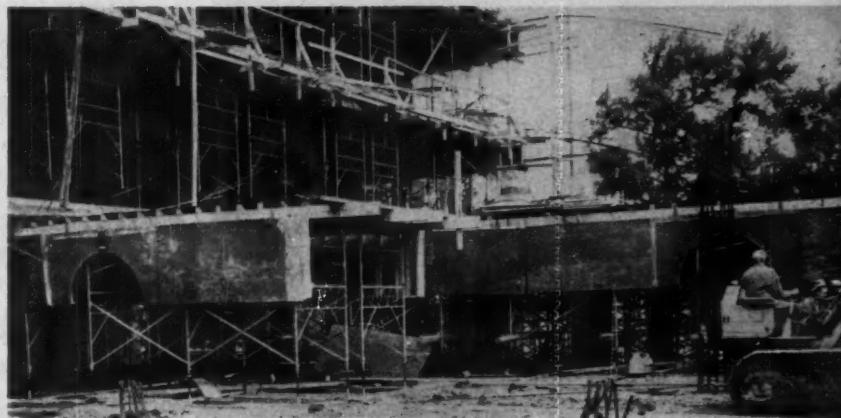


Millionth Cubic Yard

Clyde gantry crane places the 1,000,000th cubic yard of concrete at Ice Harbor Dam on the Snake River near Pasco, Wash. Guy F. Atkinson Co. of San Francisco has the contract with the Corps of Engineers. Atkinson crews have been placing concrete at a rate of 15,000 cu yd a week this summer. The dam now is about 70% complete.

Sliding Shoring

On Kaufman Department Store project in Pittsburgh, a tractor hauls out a 20x53-ft section of Trouble Saver sectional shoring with forms attached. The contractor, Dick Corp., is erecting the four-story, 272x287-ft building in 53-ft-wide sections. When one four-story section has been poured, the shoring is shifted to the next section.



Atomic Power Plant

Construction is just getting started at the site of the Consumers Power Company's big \$28-million nuclear power plant at Big Rock Point on the northern shore of Michigan's lower peninsula. Bechtel Corp., of San Francisco, is the prime contractor and engineer. Plant will be the largest direct cycle boiling water reactor system in the U.S.

University tests prove this steel guard rail has kept its strength

...after 20 years of continuous service



The first section of steel beam guard rail installed in Pennsylvania (in 1940) was selected for supplying specimen rails to test the strength of the steel after 20 years of continuous service.



Test rails were selected and removed, including one which was known to have been involved in a collision.

Here is proof that steel guard rail keeps its strength even after 20 years of continuous service in every kind of weather. In order to demonstrate that the strength of steel rail is *not* affected by time or the elements, a leading university made the following test:

Rails were taken from the first installation of steel beam guard rail in Pennsylvania, erected in 1940. All test rails had seen 20 years of service, with very little maintenance, and one was known to have been involved in a collision.

A test was set up at the university's research center in which the rails were subjected to loads applied in increments of 200 lb at the center of a 12 ft clear span, traffic-side up. Deflections were measured accurately.

Each steel guard rail tested passed with flying colors, remaining well within the test requirements. After 20 years of service, these rails had approximately the same strength as when they were installed. Further, the test indicates that notions about steel losing strength after long periods of continuous exposure just aren't true.

For detailed information about this test, write to us at any sales office, or direct to Bethlehem, Pa. And for more information on steel beam highway guard rail, ask for a free copy of our booklet 514.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation



*For Strength
... Economy
... Versatility*



CONSTRUCTION METHODS



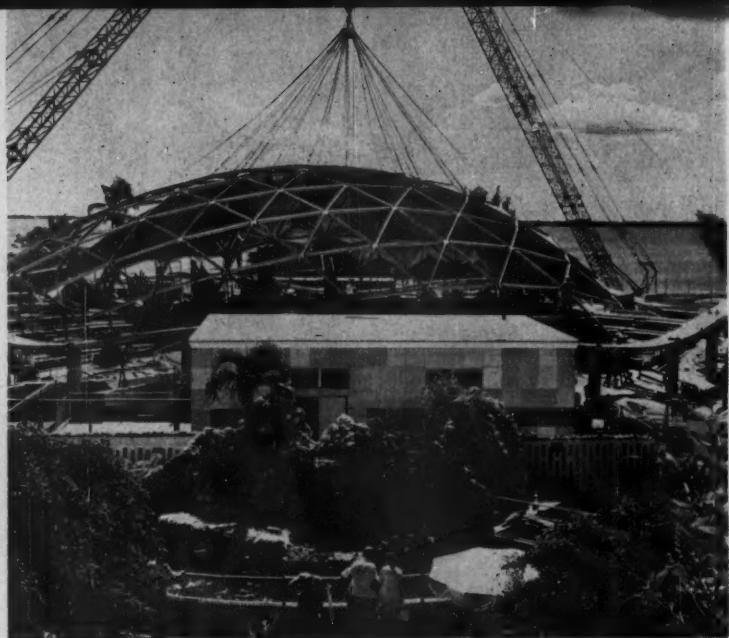
At the university, the test rails were mounted so that loads could be applied at the center of a 12 ft span. Loads were in 200 lb increments and deflection carefully measured. Result: steel guard rail has approximately the same strength after 20 years of service as when it was first installed.

BETHLEHEM STEEL

**CONSTRUCTION NEWS
IN PICTURES ... *continued***

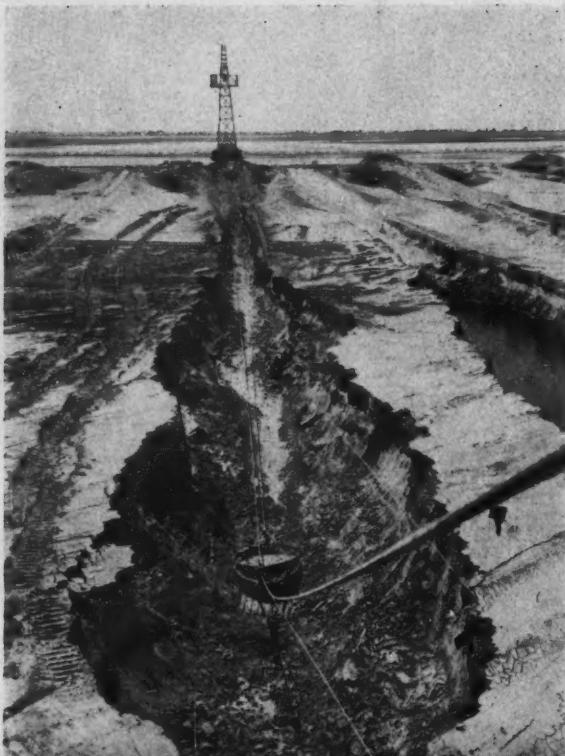
Rising Dome

Two cranes with special rigging slowly raise the frame for a geodesic dome roof at Miami's new Seaquarium. Dome is built outward as it rises. The assembly can be rotated to allow riveters to attach struts from any location. Completed dome will be 57 ft high and 145 ft in dia. Made of Kaiser aluminum, roof weighs only 23 tons.



Hot Work

Transwestern Pipeline Co.'s 30-in. gas line from El Paso, Tex., to California runs through hot country. The 25-mi sections at each of the relay compressor stations are even hotter—pipeline temperatures there will hit 125 deg. Koppers Co., who are coating the line, put on these sections special Bitumastic Hi-Melt over a coat of 70-B primer.

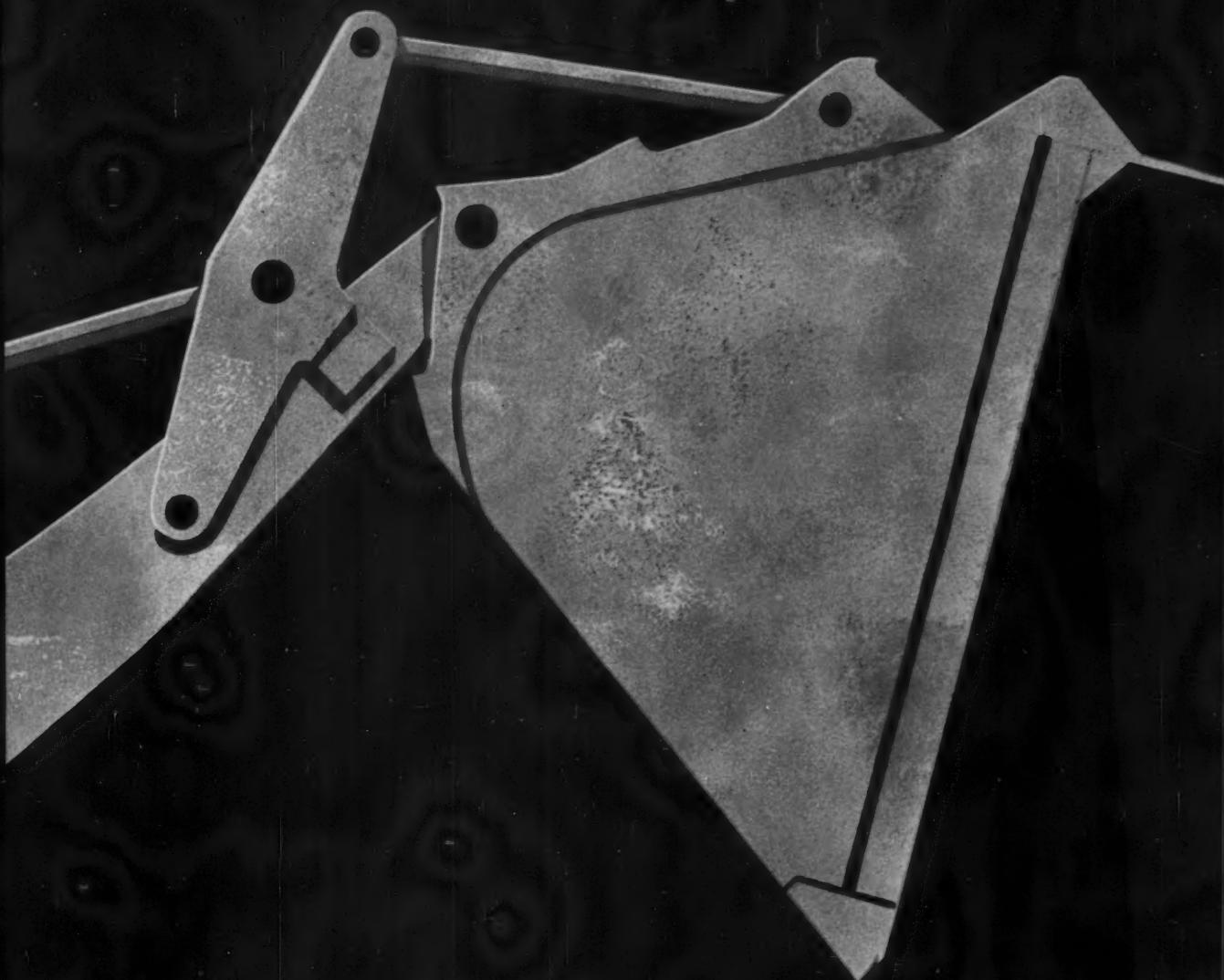


Long Drag

At Willard Dam Project in Utah, a Sauerman dragline works on earthfill dike. The dirt in this area is too wet for regular heavy earth-moving equipment. The BuRec dike, on the shore of the Great Salt Lake at Willard, will impound 215,000 acre-ft of fresh water for irrigation. It will be 12½ mi long, 455 ft wide at base, 34 ft high.

BRAND NEW...WITH 7 YEARS' PROOF!

THE GREAT NEW LINE OF CATERPILLAR WHEEL LOADERS



THE NEW 966...2 $\frac{3}{4}$ YD.,

THE NEW 922...1 $\frac{1}{4}$ YD.,



Power Shift Transmission. It's Cat-built... gives smooth, instant shifting for 1st-2nd speeds... forward and reverse. In high-speed travel range, the machine is in 2-wheel drive. A shift to work range puts power to all four wheels for full traction when it is needed.

Operator Safety. Lift arms and cylinders are all forward of the cockpit... giving complete freedom of movement. Visibility is excellent at all times. It's easy and safe to get into a Traxcavator from either side... up three wide steps. Tires are shielded by fenders.

Operator Convenience. Bucket controls are on the right side, leaving the left hand free for machine operation. The forward-reverse lever is mounted on the steering column for finger-tip shifting without decelerating; 1st and 2nd, high-low range levers placed at left of seat.

Automatic Bucket Positioner. With bucket loaded, lift lever is put in up position. The bucket goes up to dumping height and the control kicks into hold position automatically. While lowering after dumping, a pull on the tilt lever automatically positions bucket for digging.



There's a long history of extensive testing and development behind these new machines. They've been thoroughly proven in a long research program. And you're getting the full benefit of Caterpillar's 23 years of loader leadership . . . 20 years of wheel-tractor building.

All three wheel loaders have been tested, strained, tortured . . . with a field force of Caterpillar engineers watching every move . . . around the clock. After final refinements, these machines went out on customer jobs all over the country. They proved themselves with an unmatched combination of speed, operator safety and convenience, high production and traditional Caterpillar dependability. They're ready now . . . with no compromises.

THE 922 TRAXCAVATOR—1 1/4 CU. YD. BUCKET

Proven on the jump-and-run jobs

- 80 HP. Choice of compact 4-cylinder Cat turbocharged Diesel Engine (uses low-cost furnace oil) or 6-cylinder gasoline engine with big displacement for long life and sustained power. With either engine you have one source of warranty . . . one source of parts and service . . . your Caterpillar Dealer.
- Long 41" reach at 7' dumping height . . . maximum lift of 11' 2".

PROVEN IN 7 YEARS OF TESTS...THE NEW 922 AND 966

THE 966 TRAXCAVATOR—2 3/4 CU. YD. STANDARD BUCKET

Proven on jobs where time is measured in tons of material loaded

- 140 HP from the Caterpillar D333 Diesel Engine, turbocharged for extra efficiency and quick acceleration in machine drive and bucket hydraulics.
- 57" reach at 7' dumping height with a maximum lift of 12' 10 1/4".
- **LIVE ACTION HYDRAULICS** for tough material excavation, fast lift and dump.
- **DUAL-RATIO STEERING** for work and highway travel. Gives operator easy, quick turns for fast maneuvering on work cycles, safe automotive-type steering for high-speed traveling.

BOTH THE 922 AND 966 HAVE ALL THESE PROVEN FEATURES, INTRODUCED BY THE POPULAR 944 TRAXCAVATOR



Dual Brakes. The left brake neutralizes the transmission as it stops the machine. This transfers extra power to the bucket . . . assuring full loads even in tough material. The right brake stops the machine with the transmission engaged . . . giving full machine control.

Easy Service Access. The seat tips forward for easy access to transmission oil filter and control linkage adjustments. Unit construction allows independent removal of engine, transmission, other major components. The dry-type air cleaner can be serviced in about 5 minutes.

Live Action Hydraulic System. Plenty of power from the engine is always available to the hydraulic system for fast bucket action. Control valves are enclosed in the steel reservoir for complete protection. The Caterpillar Live Action Hydraulic System is full-flow filtered for trouble-free operation.

Available with a Complete Line of Attachments. There are special buckets for light or heavy materials, forks and the exclusive Side Dump Bucket that cuts maneuvering time and space because it dumps to the left as well as forward. A fiber-glass cab is also available.

● Herff and Fred Harris, owners of the Harris Sand Pit, Von Ormy, Texas, bought a 944 in April and another in June. The first machine was put to work 12 hours a day, 6 days a week. In June its service meter read 740 hours. "We haven't had a minute's down time," said Herff Harris. "This machine's been working! We like everything about it and especially the basic design that gets the lift arms out of the operators' hair. We figure the speed of the machine plus the automatic bucket positioners give us at least 25% more production than other machines of the same size."



FROM THE FIELD: HERE'S WHY THE 944 HAS GAINED ACCEPTANCE UNMATCHED IN MACHINE HISTORY

● At the Clarksville Stone Co. near Clarksville, Tenn., Charles Day speaks his views of their 944: "I believe this new Traxcavator is the best machine in its class and for several reasons. One is that open, clean deck; our operators are on and off the machine a good deal and on the 944 they can just walk up, sit down and go to work. And I've noticed the stability of the machine is better than the rest; the 944 doesn't tip—it stays on the ground. I've heard our operators talk enthusiastically about the easy controls and especially the automatic bucket positioners. Our best operators are better on the 944."

If there's a 944 operating in your area, chances are you'll get this kind of impressive report from owner and operator. But for the whole story on all 3 wheel loaders, there's only one man to see—**YOUR CATERPILLAR DEALER**. His staff of materials handling experts and heavy equipment specialists has the full story on the wheel loader line that's brand new with features, but 7 years old with experience. Ask for a demonstration on your job... see how these wheel Traxcavators make other loaders obsolete.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

CATERPILLAR

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**ADVANCED AS TOMORROW
CERTAIN AS YESTERDAY**



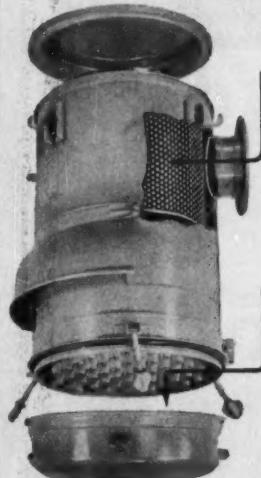
"We've found the answer to our dust problem... Donaclone Air Cleaners"

reports Ray Beaulieu,
Equipment Superintendent
for Lynn Sand & Stone
Co. of Swampscott, Mass.



"Donaclones cut our operating costs 3 ways"

Donaclones clean air 10 to 20 times better than oil bath types!



Only 2% of dust reaches Duralife paper filter!

Embossing and pleating provide maximum filtration area. Controlled porosity gives 99.9% dust removal.

98% of dust removed here!

Cluster of Donaclone tubes make up highly-efficient primary centrifugal cleaning stage. Dust is ejected into dust cup for easy servicing.

Paper filters filter best, but it takes efficient pre-cleaning to make them practical from the servicing viewpoint. Note above that Donaclone tubes remove 98% of the dust. Only 2% reaches the Duralife filter, greatly increasing service life.

Mr. Beaulieu supervises a rigid maintenance program for his fleet of trucks. He doesn't need to guess at Donaclone benefits... *he knows*. Here are the 3 savings he reports.

1. Extended engine life. "With Donaclones we can tell there will be a difference in engine life. This is revealed by our regular oil analysis program. We expect to get many more hours of life from our truck and mixer engines."

2. Cuts maintenance time. "It takes us from 3 to 5 minutes to clean a Donaclone as against an hour to clean oil bath cleaners. In terms of labor alone, the savings are appreciable."

3. Saves oil. "Our oil bath cleaners used one gallon of oil every change."

Lynn Sand & Stone Co. has installed Donaclones on nine pieces of equipment. The company expects to have 35 pieces of equipment changed over within a year.

Longer engine life will cut your operating costs. Leading equipment builders and contractors have switched to Donaclones because of proved air cleaning performance. There's a dealer near you. Tear off coupon and mail today.

Donaldson
COMPANY, INC.

666 Pelham Blvd.
St. Paul 14, Minn.

CHECK
AND MAIL

Send literature
 Have distributor call

Name _____

Clip and attach to your letterhead

More proof that...

**AMSCO HELPS YOU
HANDLE MORE TONS
PER DOLLAR**

AMSCO PUMP OPERATES 24 HOURS A DAY...PUMPS DISCHARGE 3 MILES

On the dredge C. H. Cobb, operated by New England Dredge & Dock Co., the Amsco 12" Form 50 S3B pump shown at right is "on duty" 24 hours a day, 6 days a week. It handles 5000 yards a day, pumps discharge over 3 miles with one booster...under 23 railroad tracks, through a mile-long railroad tunnel and through cliffs to a marshland.

Regarding this Amsco pump, installed 2½ years ago, Mr. C. H. Cobb, General Superintendent says—"Its performance and price make this the most desirable pump on the market".

AT
NEW ENGLAND
DREDGE & DOCK
COMPANY

JAW PLATES REDESIGNED IN AMSCO ALLOY...TONNAGE UPPED 75%

At Star Rock Products Co., Anaheim, California, crusher jaw plates previously used were giving only about 6 months' service. Large rocks dropped into the crusher often caused the jaw plates to "give" enough so the rocks wouldn't crush. Jams and costly delays resulted. Plates would often flow and crack.

Amsco collaborated on a redesign, using 2% chrome (Amsco MY) alloy. After 6 months' service, the plates were in excellent condition. Jams and delays have been eliminated, and tonnage handled increased 75%.

AT
STAR ROCK
PRODUCTS
COMPANY

AMSCO

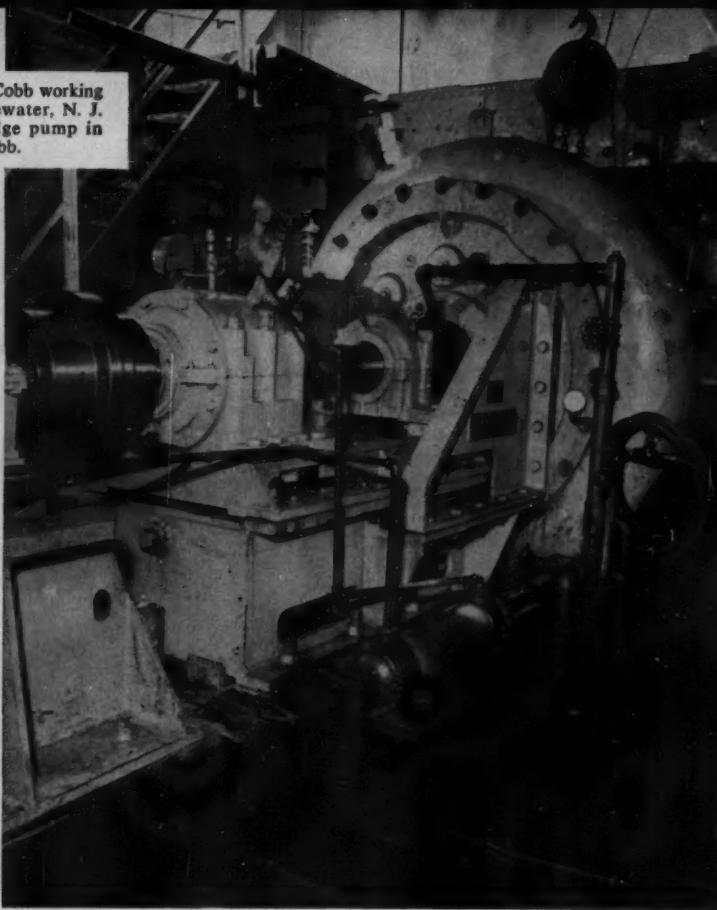
American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

AMERICAN
Brake Shoe
COMPANY

Circle 74 on Reader Service Card

Left: View of dredge C. H. Cobb working around dock area in Edgewater, N. J.
Right: Amsco 50 S3B dredge pump in pump room on the C. H. Cobb.



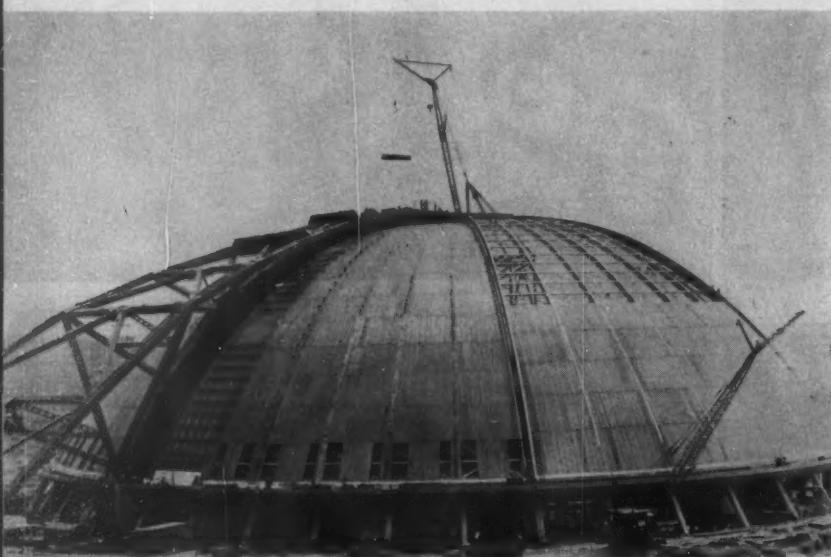
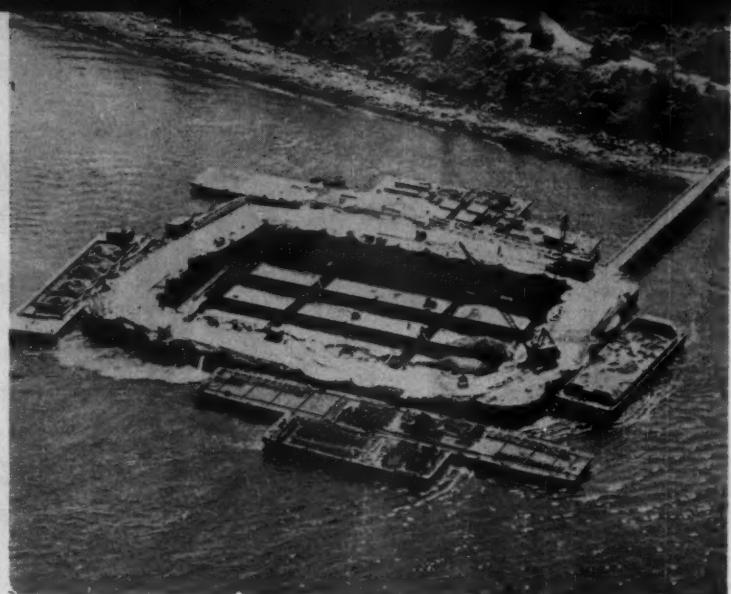
Left: General view of Star Rock Products plant at Anaheim, California.
Right: View of Straub 20 x 36 crusher at Star Rock Products. Rocks up to 18" may pass through grizzly and outer crusher.



**CONSTRUCTION NEWS
IN PICTURES . . . *continued***

Sand Island

Cutting edges are assembled for the caisson of the Staten Island pier for New York City's new Narrows Bridge. Caisson will be sunk 130 ft through sand island enclosed by L. B. Foster SP6A sheet piling. A joint venture of J. Rich Steers and Frederick Snare Corp. has a \$16.5-million contract for a caisson on each side of the Narrows.



Pittsburgh Arena

Crews are installing stainless steel sheeting on the dome of Pittsburgh's new Civic Auditorium. The 415-ft-dia dome consists of two fixed leaves and six movable leaves that open by rotating on pivots at the end of the curved cantilevered truss support (left). The auditorium is scheduled to be completed and ready to go into use by June, 1961.

Night Construction

At Wanapum Dam Project on the Columbia River in Washington, the general contractor, Grant County Constructors, is working at full efficiency right around the clock. To do this, they installed 85 Wide-Lite color-corrected mercury vapor floodlights to illuminate an area 800 ft wide and 4,000 ft long with intensities of up to 5 footcandles.



*Send For
Your Copy*

**NEW
MORETRENCH
CATALOG**



This new catalog has been prepared especially for the use of engineers and contractors who are, or may be, engaged on projects where ground water is a problem. It illustrates and outlines representative jobs of all types where difficult dewatering problems have been successfully handled. It shows and briefly describes basic Moretrench Wellpoint equipment.

Use coupon or write on your letterhead.

MORETRENCH CORPORATION
Rockaway, New Jersey

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40 STORIES from Pit to Surface



...IT'S R/M

CONVEYOR BELT FOR LONG LIFTS!

Easy troughability, flexibility, super-strength synthetic cords, high wear-resistance—make R/M Conveyor Belts ideal wherever long lifts at high tensions are required. The installation shown here, for example, was a quarter-mile conveyor with a lift from pit to surface loading station nearly as high as a 40 story building. An R/M conveyor belt made an exceptional record on this rugged haul. There's an R/M heavy duty conveyor belt for every materials handling requirement . . . each engineered to haul fuller, heavier loads—and *last longer*. With proper engineering, for example, you can increase hauling capacity up to 60%

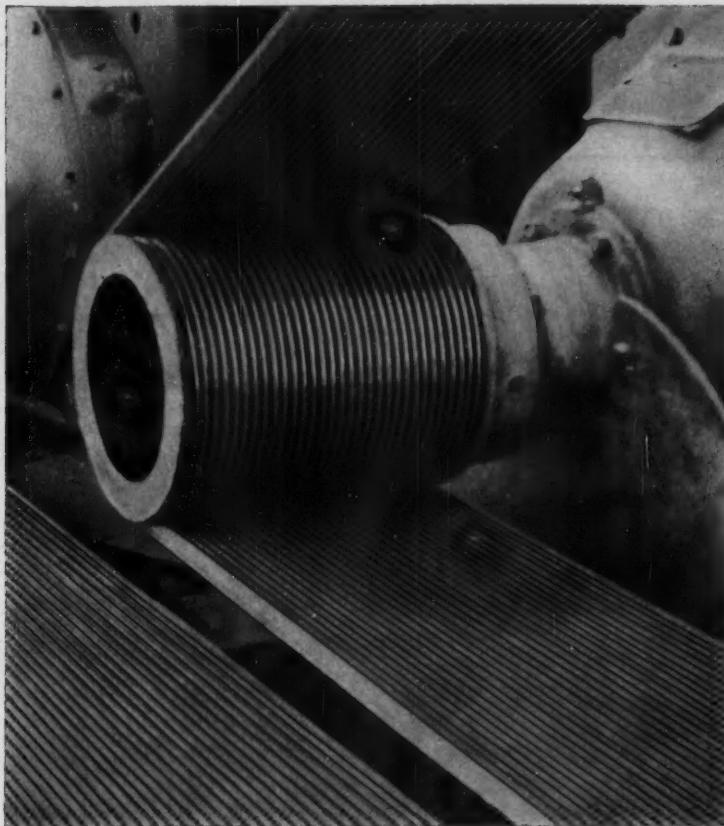
with Ray-Man Conveyor Belt and 45° idlers! Ask your R/M representative about other R/M Conveyor and elevator belts, about advantages of extra-flexible, double compensated, rip-resistant Ray-Man . . . about Homocord, the extra-cushioned belt for unusually abusive shock loading conditions, or about the Wedlok metal fastener splice which avoids vulcanizing splices. Any R/M Conveyor Belt with "XDC" cover means extraordinary resistance to wear and tear, longer life—"More Use per Dollar." Write for Bulletin M302 and Catalog CB25.

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RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

RM1018



R/M POLY-V® DRIVE

More Power—

in Less Space

... with Reliability

A single unit V-ribbed belt across full width of the drive sheave—not an assembly of V-belts—enables patented Poly-V to deliver much *more* power in the same space as a V-drive . . . or *equal* power in much *less* space! Single unit belt design also eliminates belt "length matching" problems . . . minimizes equipment downtime and belt replacement costs. Belt speed ratios remain constant from *no* load to *full* load to provide the smoothest running, coolest running—*longest wearing* drive you can install. Maintain groove shape. Just two sections of Poly-V Belt meet every heavy duty power transmission requirement. Write for Bulletin M141, or call your R/M Distributor.

**CONVERT TO RM POLY-V
and BE SURE!**



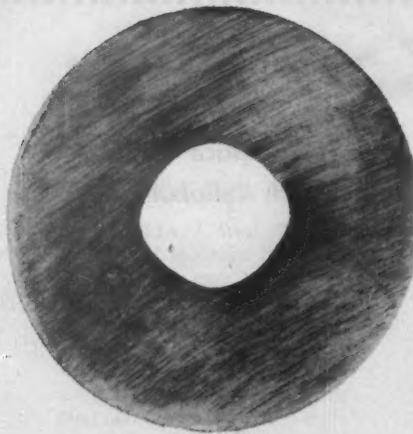
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HOSE

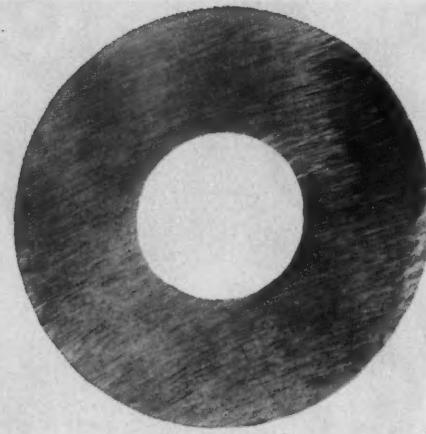
**more flexible,
weighs less
than any hose
for equal pressure**

- SUPER-STRONG
- PRECISION BUILT
- NO PRE-SET TWIST—WILL NOT KINK
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- EASIER, SAFER COUPLING

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Cross section of average extension steel,
showing distorted center hole.



Cross section of Sandvik Coromant Steel,
showing perfectly uniform center hole.

*See for yourself why SANDVIK **Coromant** Steels last longer on the job!*



Sandvik-originated smooth rope-threads make uncoupling easy.

The completely unretouched photographs above show clearly why Sandvik Coromant large-diameter extension rods last longer! Since Sandvik takes the time—and the trouble—to cold-roll these alloy drill rods, the flushing hole is uniform all the way through—smooth as a gun barrel. And, since the hole is even and perfectly round, you set up fewer strains and stresses in use...there's less whipping...and therefore, less breakage. And, with mechanically stronger rods, we can provide larger flushing holes for faster, more complete removal of cuttings.

What's more, the Sandvik-originated rope-thread makes coupling and uncoupling a hand operation—speeds the job—and reduces chance of incipient cracks developing from wrench marks.

All in all, you can't beat Sandvik Coromant Rope-Thread Steels for fast work and long life! Available from 1½" to 2" in diameter. To set up a test on your job, write to your nearest Atlas Copco office today. Address: Dept. CM-17.

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Construction 'Round the World...

In Japan

A Bucyrus-Erie 150-B shovel dumps earth and boulders into a 22-ton Euclid truck while a Cat D8 stands by. Material will be hauled 1½ mi to Japan's first rockfill dam, Miboro Dam, on the Sho River. Hazama-Gumi Construction & Engineering Co., Ltd., is building the 430-ft-high, 1,330-ft-long dam, which requires about 1,040,000 cu yd of fill.

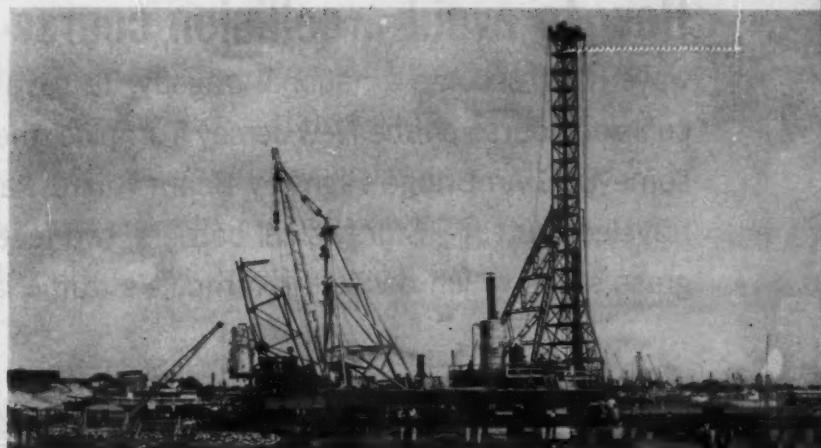


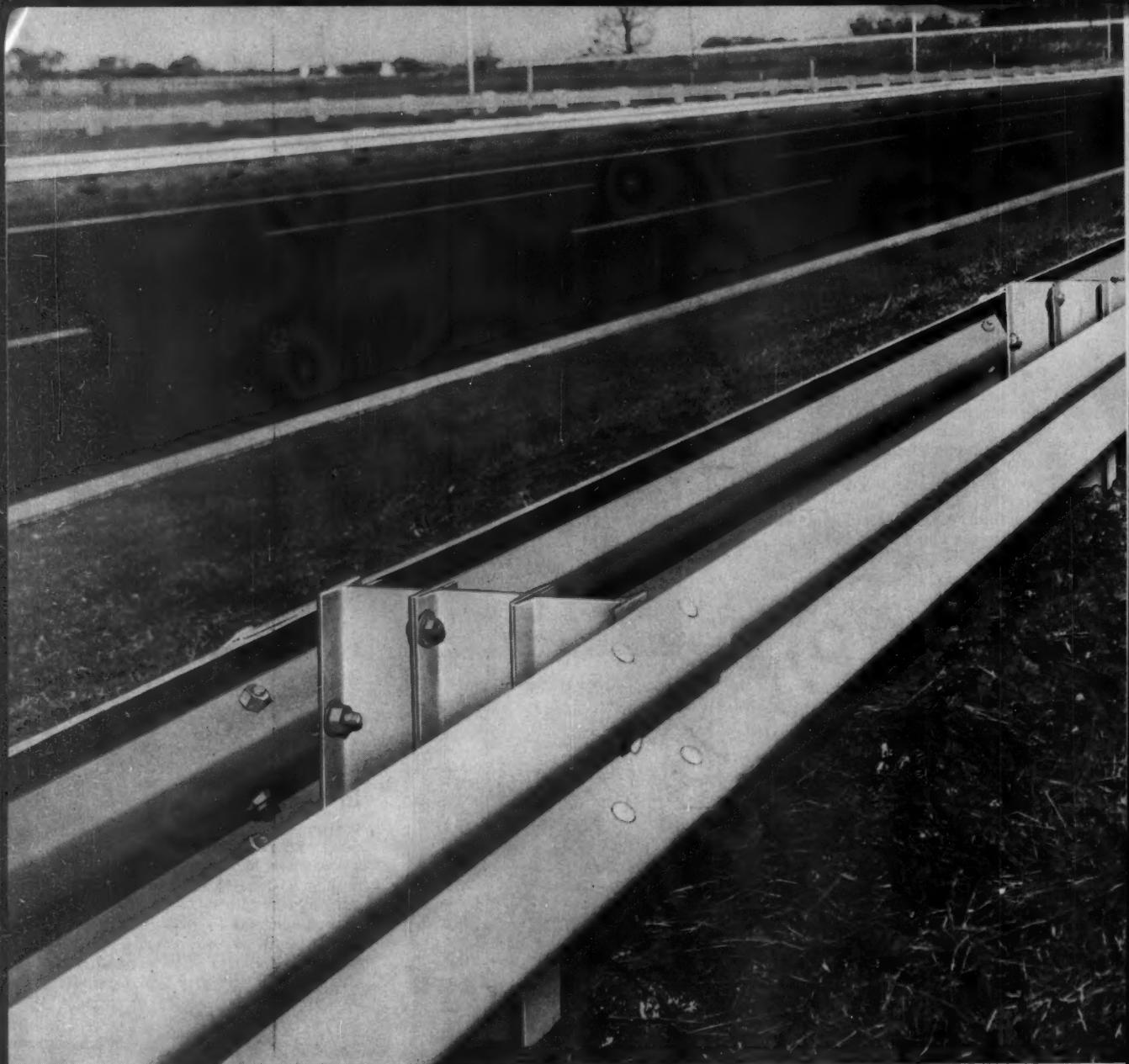
In West Berlin

Workmen place prestressing conduits and reinforcing steel for the 2,970-ft-long Nordwestbogen Bridge with a 95-ft-wide deck. The pre-stressed concrete structure, claimed to be among the longest in Europe, is being built by Dyckerhoff & Widmann KG of Berlin at an estimated cost of \$3.85-million. It's a twin box-girder structure 43 ft high.

In Kenya

A 100-ft-high traveling pile driver stands erected while another one 80 ft high is being assembled for the construction of four new berths in the harbor of Mombasa. A 60-ton floating derrick with a 90-ft boom handles the erection job. The harbor project is being built by Christiani & Nielsen for East African Railways & Harbors, Nairobi.

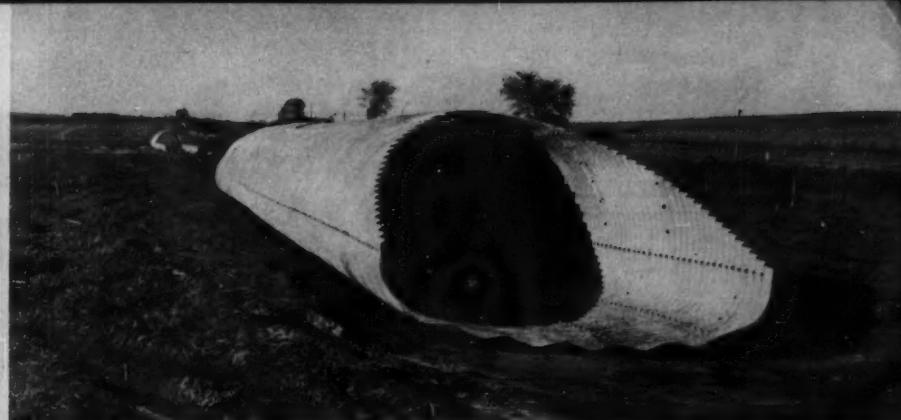
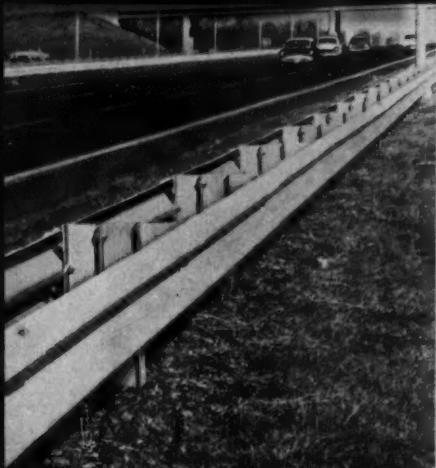




How to avoid a collision course Head-on collisions on our highways have become a national tragedy. To save hapless drivers from steering a collision course on the New Jersey Turnpike, the Turnpike Authority has erected some USS AmBridge Highway Beam Guard Rails and Posts along this heavily traveled route. □ Sturdy steel barriers, two feet high, will be centered along the grass strips which divide the turnpike's traffic lanes. The barrier rails are made

This mark tells you a product is made of modern, dependable Steel.





USS AmBridge Sectional Plate is perfect for drainage structures or underground passageways. It won't crack, won't break. It's easy to install because there's no need for forms. AmBridge Sectional Plate comes in a complete range of sizes.

USS AmBridge I-Beam-Lok is a sturdy, lightweight bridge flooring. It installs quickly and easily with few interruptions. The filled type is available in units 6" wide and up to 48' long that apply directly to stringers on spans from 6' up to 8' centers. The open type is also available for spans up to 4' centers.



of 10-gage steel plate bolted to spacers on 6" WF, 8½-lb. steel posts 5'9" long. These barriers are rugged. They'll put an effective stop to cars skidding across the grass into oncoming traffic. **USS AmBridge Steel Beam Guard Rail** is highly visible. It bolts easily but firmly to steel posts and is available in 12'6" and 25' lengths to minimize splicing. Write or contact any one of our offices for literature and information on American Bridge Highway Products.

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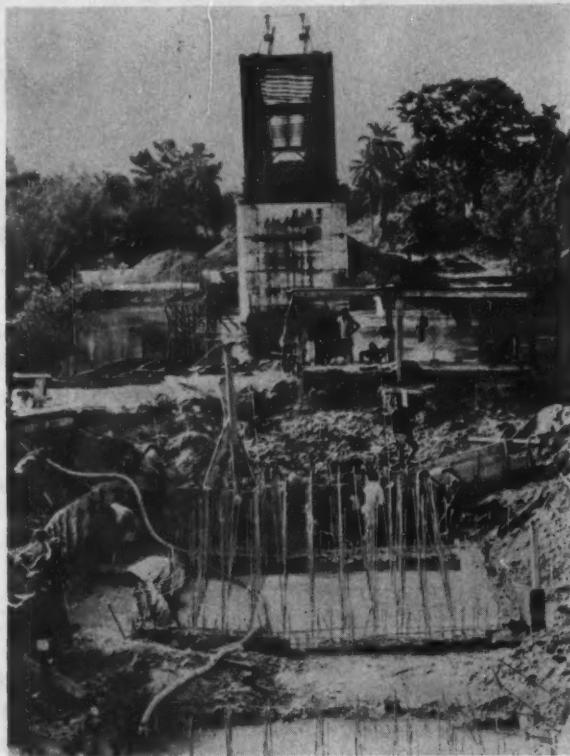


Circle 83 on Reader Service Card

**CONSTRUCTION 'ROUND
THE WORLD . . . *continued***

In Okinawa

Earthfill Zukeyama Dam, now under construction, is 55 ft high, 16 ft wide at the crest, and 320 ft wide at the sluice box. When completed, the dam will impound 600-million gal of water, flooding 115 acres for water storage. The work is being done for the Okinawa District of the Army Corps of Engineers by the Japanese firm Notomi Kensetsu.



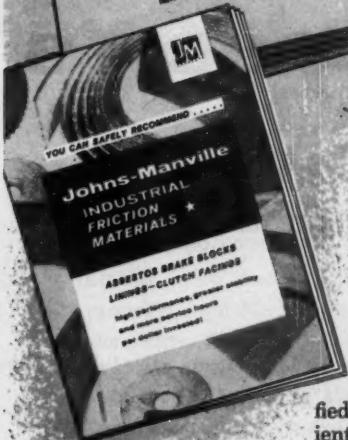
In Lebanon

Caterpillar pipelayers lay 30-in.-dia pipe during the construction of 19.6-mi crude oil pipeline from the Syrian border to Tripoli terminal. In first 3 mi alone, the pipeline crossed 100 irrigation channels. Another 3 mi was in solid rock. Contracting & Trading Co. of Beirut is constructing the \$900,000 project for the Iraq Petroleum Corporation.

In Guinea

Workmen pump out footing forms prior to pouring concrete for a railroad bridge abutment. The bridge is one of eight on a 96-mi railroad that will serve FRIA bauxite mining and alumina refinery of Olin Mathieson and its five European partners. The \$150-million project now nearing completion is being built by the French firm, Monod.

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in seconds...



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Johns-Manville Industrial FRICTION MATERIALS



The season's

*Geo. M. Brewster & Son, Inc solution includes use of
one dozer, this big 375 hp Michigan, to spread
25,000 yds daily on 3 fills*

How would you handle a job where the state-specified borrow pit was on an island and the main fill was across 400 ft of river water . . . and where there were no bridges in between?

This was the puzzling problem faced by bidders on a 1,400,000 yd. 4 mile section of Route 129 Freeway near Trenton, New Jersey.

Think about it. What *would* be your method of bidding?

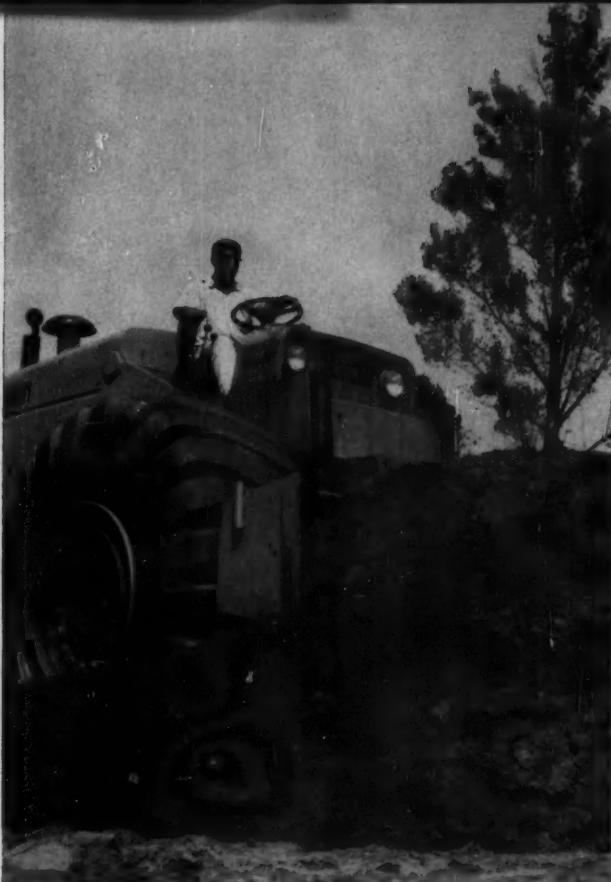
Would it be dredging? Some firms figured that way. Or building high trestles above the river to serve as haul roads? Or using barges to ferry fill across the water? Or what?

Flood danger makes speed essential

The successful bidder in this case had a different solution—one as novel as the problem. Geo. M. Brewster & Son,

Inc, well-known Bogota, N. J. contractor, placed their bid, roughly \$4,500,000, on a gamble. They would dam the inside channel of the river on its upstream side, let the water drain, then build several inexpensive earth causeways to the mainland fill area. The question was, "Could they move the necessary dirt quickly enough to avoid high water, yet economically enough to do the job at a profit?" For this river, the Delaware, has been known to rise at least 15 ft above its present normal stage. The bid was low . . . the job won . . . but speed became absolutely vital.

Fast mobile equipment and two 10-hour shifts per day were the basic choice. Yet for economy reasons a relatively small fleet did all work. A tractor-pulled and pushed belt-loader did the loading. Ten 16-yd bottom-dumps moved the fill. One machine—a high-speed 375 hp Michigan



most unusual job

Model 380 Tractor Dozer—handled *all* spreading.

Michigan replaces 2 or 3 crawlers

Brewster figures that because of its 25 mph speed and its power, the big Michigan replaced two or three large crawler dozers. *Working alone, it easily handled three separate dumping areas.* One pass forward leveled each long line of dumps . . . one in reverse back-bladed . . . then the Michigan would drive to another fill area where the operation would be repeated.

Tires help compaction

In this way, the one 375 hp unit took care of all 10 haulers and all fills. It regularly spread 25,000 yds of soft silty sand every 20-hour day. Despite high production demands, it even had time to clean up and make extra compaction passes. In fact, Brewster figures the large low-pressure tires on his 75,000 lb Michigan did the bulk of the compacting—even though the New Jersey Highway Department required final use of vibrating rollers.

Unit also reduces maintenance

In the final analysis, dirtmoving completed long before flood season, use of the big Michigan had cut costs in some extremely important ways. One, it alone did the work of several of the biggest crawler-dozers. Two, it completely eliminated track maintenance and repairs, which in sand like this, could total \$10 per hour, or more! Three, it proved versatile enough to spread gravel sub-base as well as sand fill, handle emergency truck towing, and do much of the compaction on all 3 fills.

Michigan job-proved Tractor Dozers could do the same for you! Pick the size to fit your job—162, 262, 375 or 600-hp—then call your Michigan Distributor for a demonstration. You name the time and place.



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Circle 87 on Reader Service Card



Traction and mobility bring major economies to well-known paving firm

Save \$50,000 investment

This Michigan Tractor Shovel—one of 11 owned by Texas Bitulithic Company, Dallas—has, *by itself*, saved a \$50,000 investment *plus*, in most cases, \$4 per operating hour.

It alone has replaced a three-unit fleet common to many paving operations. Namely, a 130-plus hp crawler formerly used to pull a big 10,000 lb, 24-30 ft strikeoff planer—and another 130 hp crawler and matching scraper used to supply and remove gravel ahead of the planer. "Duplication of these three machines, which were moved to another job, would have cost us \$75,000," says L. A. Armstrong, Texas Bitulithic assistant secretary-treasurer. "Their operation would require one more man and \$4 per hour more actual operating costs (not counting depreciation, etc.)."

Instead, the \$24,000, 133 hp, 26,500 lb Model 175A Michigan does both towing and gravel supply-removal jobs.

Torque converter smooths towing operation

On towing operation, Michigan dependability and tractive ability have probably been the most important factors. Machine has four-wheel-drive, weighs 26,500 lbs, so has no trouble pulling the big two-lane planer. Its torque converter drive has virtually eliminated wheel spin, so holes in the sub-grade are no longer a worry. Operator has excellent view of leveler blade, and Michigan's power steer gives the instant fingertip control so necessary to towing any planer. And the dependable Michigan has lost no assigned work-time—so Texas Bitulithic's paving

crew has never needed to slow down due to insufficient crowning.

25 mph speeds gravel supply task

On gravel handling, mobility is probably the key factor in Michigan's success. For example, every time material piles high ahead of the planer, the Michigan operator simply stops his machine, detaches a drawbar pin, and drops the planer yoke. In a few minutes, excess material has been Michigan-handled: cast aside or truck-loaded. Similarly, when more material is needed, the 25 mph Michigan runs down the sub-grade to a break in the forms, scoops up a 2½ yard load, and hurries back. Re-attachment to the big planer takes one man (the Michigan operator) only a few minutes, and planing continues.



When excess gravel piles ahead of planer, Michigan is detached to work as loader. Rig thus eliminates separate machine customarily used in this operation. Job shown: paving of new loop expressway around Fort Worth.

Four to five hours work with Michigan easily readies 1,500 to 2,000 ft of sub-grade . . . all Texas Bitulithic's paving crew usually pours in a day. Michigan pulls the 20-30 ft leveler along the crown at $\frac{1}{2}$ mph.

Texas Bitulithic's 10 Model 75A Michigans handle all sorts of assignments around company's 25 concurrent contracts. Typical tasks include carrying pipe (right), back-filling (far right). Machines were sold by local Michigan distributor, Berry Brothers Machinery Co.



—and \$4 per hour

Ten other Michigans do varied jobs for pipe, dirt, paving crews

Elsewhere, Texas Bitulithic Company continues to make good use of their 10 other Michigans (all 80 hp, $1\frac{1}{4}$ yd Model 75A's). "We run 25 to 30 jobs at a time," explains Equipment Supt R. H. Arnold, "do \$15,000,000 to \$20,000,000 worth of earthmoving, bridge work, concrete and asphalt paving per year. We put one 75A on each major job . . . shuttle our other Michigans, under their own power, between two to five smaller jobs each. Tasks include hauling concrete from mixers to pour sites. Carrying pipe. Truck-loading sand, gravel and dirt. Leveling parking lots. And many, many others."

Another money-saving use for the Model 175A Michigan. With tires replaced by segmented steel wheels . . . compaction. This unit belongs to Ruby Construction Company, Louisville, Kentucky. Its job: compacting clay fill on 0.57 mile section of Louisville's new cross-town expressway. Performance: over 100% standard Proctor in two or three passes. Output: all the clay delivered by 12 twelve-yard dump trucks—a total of 5,000 bank yards per 20-hour day. Savings: the Michigan, using bucket occasionally to spread truck-dumped fill, eliminates full-time assignment of a dozer. Also, the all-wheel-drive Michigan fills low spots . . . backfills around pipe and abutments . . . removes boulders from the fill material.



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What do you want to cut besides costs?

Name your problem. Are you clearing land...cutting lightweight beams...leveling piling? If it's a wood-cutting job, there's a **McCulloch Chain Saw** to handle it fast! McCulloch saws start easily in any weather, cut at full power overhead or sideways. For safety, automatic clutch stops chain when idling. Operating costs are low. McCulloch's exclusive New Super Pintail® Chain stays sharper, lasts longer than any other make. Rugged McCullochs have been the choice of professional loggers for years. It's an ideal **portable power tool**, too. Attachments are available for drilling earth or rock, boring heavy timber, cutting brush or wildgrass. The world's **Number One** saw in sales, quality, dependability and dealer network service. Seven professional models starting at **\$149.95** with full 16" bar. A card to McCulloch Corporation, 6101 W. Century Blvd., Dept. CM-1, Los Angeles 45, Calif., will bring full information.

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LEADERSHIP THROUGH CREATIVE ENGINEERING



S-0604

There's Profit in Safety

REPORTS OF CONSTRUCTION TRAGEDIES can be read day after day in almost any newspaper. And the real tragedy is that in almost every instance the accident could have been prevented. Here's a random sampling:

In Canada, a construction worker was crushed to death when a hydraulic jack, which was helping to erect a bridge girder, blew a seal and toppled the structural member.

In the Northwest, three men laying pipe in a deep trench were killed—smothered to death in a cave-in.

In Boston, two men died when a crane became overbalanced and toppled into an excavation.

On the West Coast, a groundsman was electrocuted when the boom of the crane he was supposed to be tending came in contact with high tension wires.

Now, why wasn't the girder cribbed and braced to prevent its fall in the event of jack failure? Why wasn't the trench sheeted properly? Who overloaded the crane? And why didn't the groundsman stay alert?

The prime factor causing accidents is man. And man must take the responsibility for preventing them. This responsibility extends from the newest apprentice to the top man in the contracting firm. Yet too often the thought is, "Let the other guy take care of it." Obviously, under these circumstances, no one's going to take care of it.

This condition is pointed out by construction's disturbingly high position in the National Safety Council's tabulation of accidents in various industries. And it is reflected directly in our insurance rates.

The cost of insurance and the direct cost of accidents are only part of the story. Indirect costs are estimated to average $4\frac{1}{2}$ times the direct ones. So management men who want their companies to prosper—and, indeed, under today's highly competitive situation, perhaps even to survive—must give accident prevention the attention it deserves.

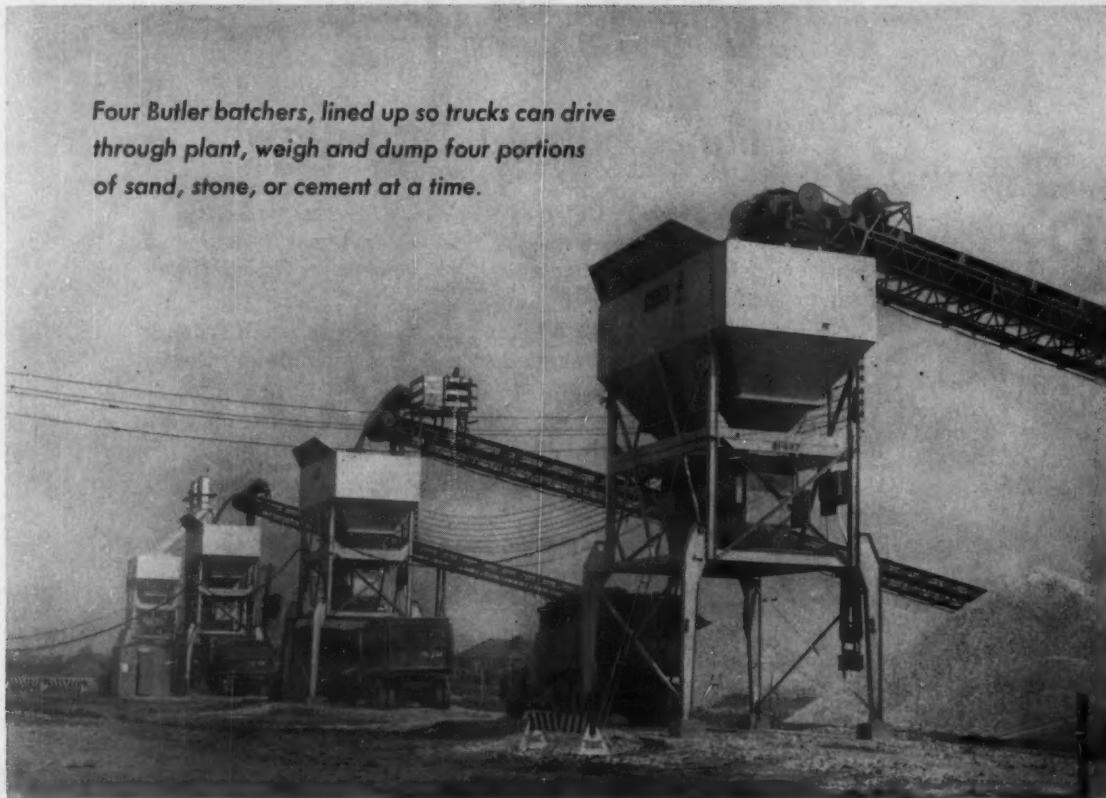
As for the fellow down the line, what's in it for him? Why should he actively participate in a safety program? Well, beyond the obvious humanitarian aspects of protecting himself and his fellow workers, he too has a financial stake in accident prevention: Income from workmen's compensation doesn't come close to matching construction wages.

So, from top to bottom, accident prevention is everybody's business. The guy who says "Let the other fellow do it" is hurting himself worst of all.

Want to learn the latest accident prevention techniques? Plan now to attend the Construction Sessions of the National Safety Congress, Conrad Hilton Hotel, Chicago, October 17-19.

Modern Batch Plant Keeps

Four Butler batchers, lined up so trucks can drive through plant, weigh and dump four portions of sand, stone, or cement at a time.



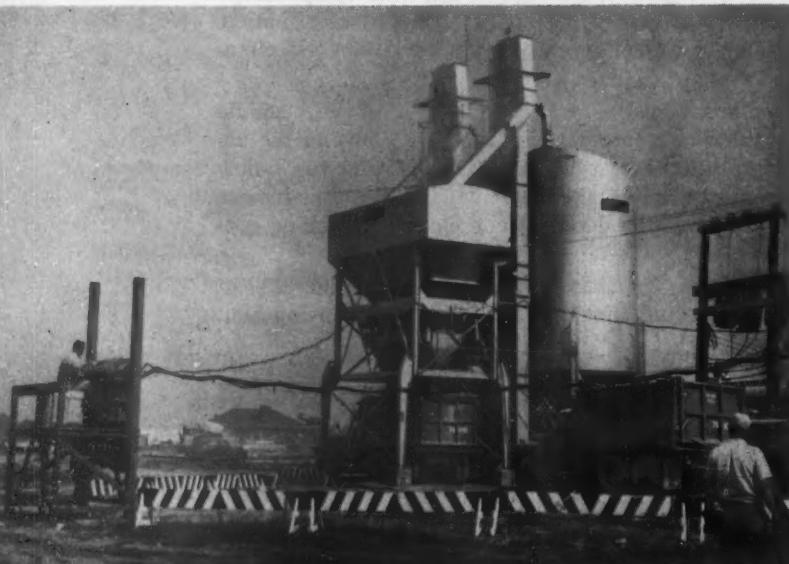
JET PLANES SET THE PACE for the contractor extending one of the runways at Chicago's O'Hare Field—and it's a fast one. S. J. Groves & Sons Co. of Springfield, Ill., set up their paving schedule so the runway will be shut down only eight days.

On each of these eight days, Groves paves a 25-ft-wide strip the entire 2,700-ft length of the eight-lane-wide extension. Because the slab is a uniform 15 in. thick, this means that more than 3,000 yd of concrete must be placed on each of the paving days.

To meet this schedule they brought in four pavers to head their paving train. They set up a brand-new automatic batch plant with a tremendous capacity to insure a steady flow of material to the pavers. They took care that nothing would interrupt paving once it started, because time is of the essence on this job.

Besides the 8,800-ft runway being extended, there is only one other at the airport that can handle the big jets. Engineers supervising the work laid down the requirement that the runway worked on must be available for emergency use most of the time. This means the contractor must keep the runway open during much of his operation.

The only exception is at the beginning of a pour, while the paving train is within 1,000 ft of the end of the runway. After the first few hours of paving, the train is



CENTRAL SWITCHBOARD—Single operator on wood platform controls batchers.

Four Pavers Rolling



Four pavers combine to place a batch every 15 sec as contractor rushes to complete paving one of eight 25-ft-wide lanes in 2,700-ft runway extension

ordinarily beyond this point and the jets can use the strip for emergency landings.

When paving operations are not underway, the jets can take off as well as land on the runway. They use an 8,000-ft-long stretch starting about 700 ft from the end being extended. They take off heading away from the contractor's crews at work preparing the subbase. Even at this distance the powerful jet engines sometimes throw dirt and debris at the workmen like a vacuum cleaner blowing dust, but the authorities feel there is not sufficient danger to merit setting up a barricade.

Here's the sequence of Groves' paving plan. It's governed by the provision that three days must elapse before paving equipment can ride on a poured slab. They pave the two center lanes first, with a 3-day break between pours to allow the first lane to set up enough to support the paving train. Then the next day they jump over to the other side of the first lane and do the lane adjacent

to it. Two days later they pave the lane next to the second lane, and so on, jumping back from one side of the runway to the other until all eight lanes are paved. Fastest the operation can be done in is 13 days, but at any rate they figure the actual paving will only take a day per lane, or eight days altogether.

Batchers Back Up Train

The batch plant supplying the paving train is as modern as the jets continually zooming by overhead. It consists of four automatic Butler batchers set up in a line so trucks can move through the plant from one end to the other. The 18 Ford four-batch trucks move from batcher to batcher, getting four correctly weighed portions of stone, sand or cement at each stop. Each batcher weighs and dumps material for four batches simultaneously, at the touch of a button on a central control board. Two dole out limestone aggregate (maximum size of the larger stones is 2 in., the

smaller stones run up to $\frac{3}{4}$ in.), one adds sand and the other adds cement.

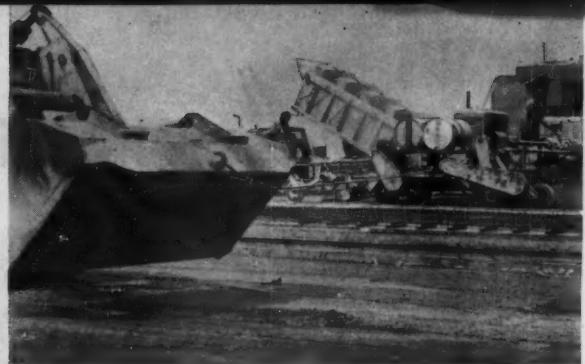
The manufacturer claims top capacity of the plant is about 720 batches per hour, but Groves operates it at an average rate of 300 batches per hour. They bought the units originally for use at the now defunct Bong Air Force Base; that's why the capacity is so much higher than they need. Still it's good insurance against any stoppage in the flow of material to the paving train.

A single operator at a central switchboard controls operation of all four batchers. Mounted on a wood platform in an open spot within view of all four units, the operator simply pushes a button to start the weighing and dumping process at each unit. A flashing light goes off when batching is complete at any unit; then the operator signals the truck driver to move ahead.

The sand and stone plants each mount a 150-ton hopper that feeds the batch bins. Three 36-



PLACING TOP COURSE—Paver dumps load of concrete for 4-in. top course on welded wire mesh.



STEADYING SPREADER—Cable attached to bucket of Hough Payloader keeps spreader from sliding.



PLACING JOINTS—Workmen install plastic joint formers in slit made by vibrating bar.

MODERN BATCH PLANT . . . *continued*

in. Pioneer conveyors charge the hoppers from stockpiles built up behind each batcher. An operator on a wood platform mounted on top of one of the batchers controls the conveyors.

Two cranes — a Bucyrus-Erie 38B and a Northwest — fitted with 2-*yd* clams charge the 20-*yd* hoppers that feed the conveyors at the stone batchers. An Allis - Chalmers HD6G tractor shovel with a 2½-*yd* bucket feeds sand to the conveyor at the sand batcher.

Combined capacity of the two silos at the cement batcher is about 1,500 bbl. Groves uses as much as 5,000 bbl of Universal cement per day when paving is going full blast. It comes to the job in bulk from a railhead about 1½ mi away, where a 14x35-in. Burmeister screw loads the trucks. Aggregate, both sand and stone, comes to the job from a commercial supplier about 35 mi to the north.

Pavers Hit Fast Pace

With checkered flags waving a warning to low-flying aircraft, the four pavers at the vanguard of the paving train forge ahead

steadily. One of them is a Rex, the other three are Koehring's. All four are dual-drum 34E models.

The pavers combine to place a 1-*yd* batch of concrete every 15 sec. Three of them place concrete for an 11-in.-thick bottom course. The other places a 4-in.-thick top course over 6x12-00/3 welded wire mesh that weighs 80 lb per 100 sq ft. Five 2,500-gal Ford water trucks supply mixing water for the pavers.

Two Jaeger spreaders distribute the concrete evenly between the forms. One works behind the three lead pavers, the other follows the paver that places the top course. A Jaeger-Lakewood finisher and a Rex finisher-float bring the total of transverse screeds finishing the pavement to five.

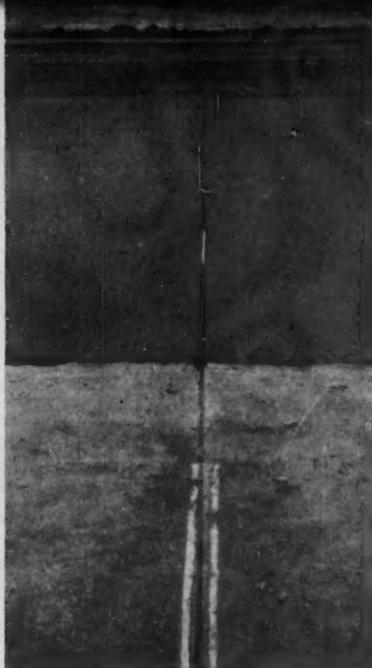
Behind the finishing machines come a joint placing rig that installs plastic joint formers, a Heltzel bridge fitted with a belting machine and a burlap drag, and a Rex spray rig that applies curing compound.

After the first run, Groves replaced the steel wheels on one side of the paving equipment with

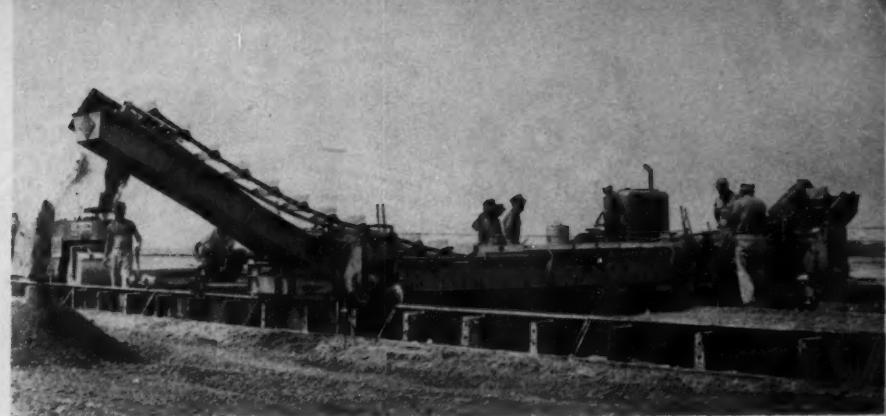
rubber wheels that run on the already concreted slab. Because of the crown, which makes a slight pitch on both sides of the centerline, the steel wheels on the outer side of the lanes have a tendency to slide off the forms. Groves remedied this by reversing the wheels so that their flange rode on the inside of the forms, holding the rig on line. But they neglected the change-over on one of the spreaders, and as a temporary expedient they held it in place on the second lane by stretching a cable from it to a Hough Payloader running alongside on the completed slab adjacent to it.

Subcontractor Sets Joints

Amos Barton Construction Co. of Bloomington, Ill., handles placing of plastic strips that make preformed construction joints in the slab, as well as spraying Artco curing compound that eventually covers it. They adapted a bridge formerly used as guide for sawing joints to place the plastic Form-Con strips. The rig vibrates a steel bar down into the concrete, making a narrow slit for the two-piece plastic joint former.



IN AND OUT—Joint formers have been stripped from slab in foreground. Plastic film airs in curing.



SUBGRADING — Groves leaves granular subbase high purposely. Blaw-Knox subgrader brings 12-in. layer down to within about $\frac{1}{4}$ in. of the final grade.

FORMING KEYWAY

—Three-man crew installs sheetmetal form for keyway to side of paving form. Legs hold channel-shaped section, and pins anchor it.



This method works better than that used on an earlier job at Dulles International Airport (CM&E, Oct. '59, p 120). There the contractor vibrated the plastic strips themselves down into the concrete. Prongs held the strips in position below a vibrating bar. The trouble with this method was that the prongs dug out small holes along the sides of the strip, disturbing the concrete and making more work for the finishers.

The vibrating bar used by Barton does away with this drawback. The bar makes a smooth, straight slit for the plastic joint former to fit into. Besides, engineers on the job point out that the bar is not as likely to push aggregate away from the slit, leaving weakened concrete at the edges of the slit.

A two-man crew runs the rig that vibrates the bar into the concrete. They place two 12½-ft-long plastic strips in the slit formed by the bar at each joint, which are spaced at 50-ft intervals. With wooden floats they work the strip down carefully to its full depth of 3 in. Little or no trowel work is needed to clean up around the joint.

Barton strips the plastic joint formers a day or so after the pour, getting them out early in the morning before the sun heats up the slab and expansion tightens the joint. Ordinarily they come out easily, with no damage. Because they are usually left a fraction of an inch higher than the concrete when installed, there is no film of hardened concrete on top to break through. Barton expects to get about 10 reuses from the joint formers.

Plastic Protects Joint

When the strips have been removed, workmen cover the joint with a narrow band of plastic film that seals in moisture and aids curing inside the joint. Adhesive along both edges of the band grips the concrete firmly. Later, when all paving is completed, a crew will return and install a Presstite neoprene filler in the slit and cap it with Presstite joint material.

Barton's subcontract includes pulling the paving forms and moving them from pour to pour. It doesn't include setting up the forms, however; Groves takes care of all the preparatory work them-

selves. They lay down a 12-in.-thick layer of granular subbase with a Jersey spreader mounted on a Caterpillar D9. A Blaw-Knox subgrader finish grades the base to within about $\frac{1}{4}$ in. of final grade. A Le Roi Tractair powers the air tools used by the crew who set the paving forms.

Boom Truck Hauls Forms

To haul paving forms from place to place about the job, Barton utilizes an old Army 6x6 truck fitted with a job-built swinging boom behind the cab. Powered by a takeoff from the truck engine, the crane has a capacity of about $\frac{1}{2}$ ton. Its boom is only about 4 ft long, just enough to make it handy for loading the truck.

The paving forms rest on two sections of scrap pipe about 4 in. in diameter welded transversely across the frame of the truck. Pins fit into holes at the ends of the pipes to hold the forms in on both sides. The front pipe is blocked up somewhat off the truck frame, tilting the forms slightly so they can be slid off the rear easily when unloading. (The truck also comes in handy for odd jobs such

MODERN BATCH PLANT . . . *continued*



HAULING PAVING FORMS—Boom truck is handy rig for hauling paving forms about job. Pipe sections welded transversely to frame hold forms tilted slightly towards rear for easy unloading. Subcontractor Barton pulls forms but doesn't place them.

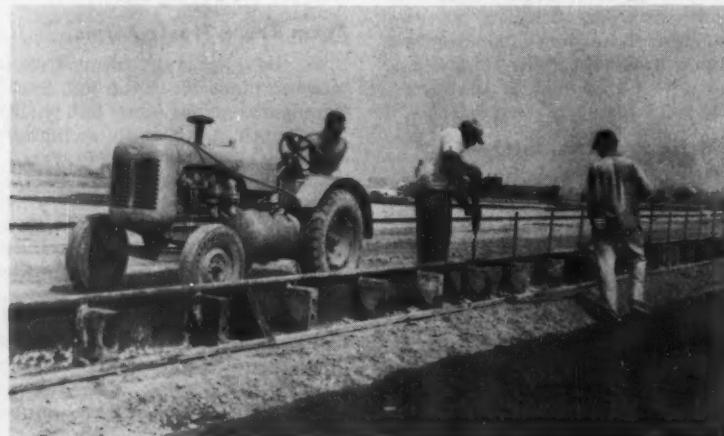
as loading drums of curing compound onto the spray rig.)

Barton also has on hand a shop-built pin-puller used in stripping the paving forms, which usually occurs the day after a pour. The rig is a close copy of commercial models on the market, but all

components except wheels and machine parts were fabricated in their shop.

Prefab Keyway Forms

Just about the last step in the preparatory work required to get a lane ready for paving is instal-



PLACING FORMS—LeRoi Tractair powers hammer that drives pins holding paving forms.

PULLING FORMS—Barton's shop-built pin-puller closely resembles models on the market.

lation of a sheet metal keyway form to the sides of the paving forms.

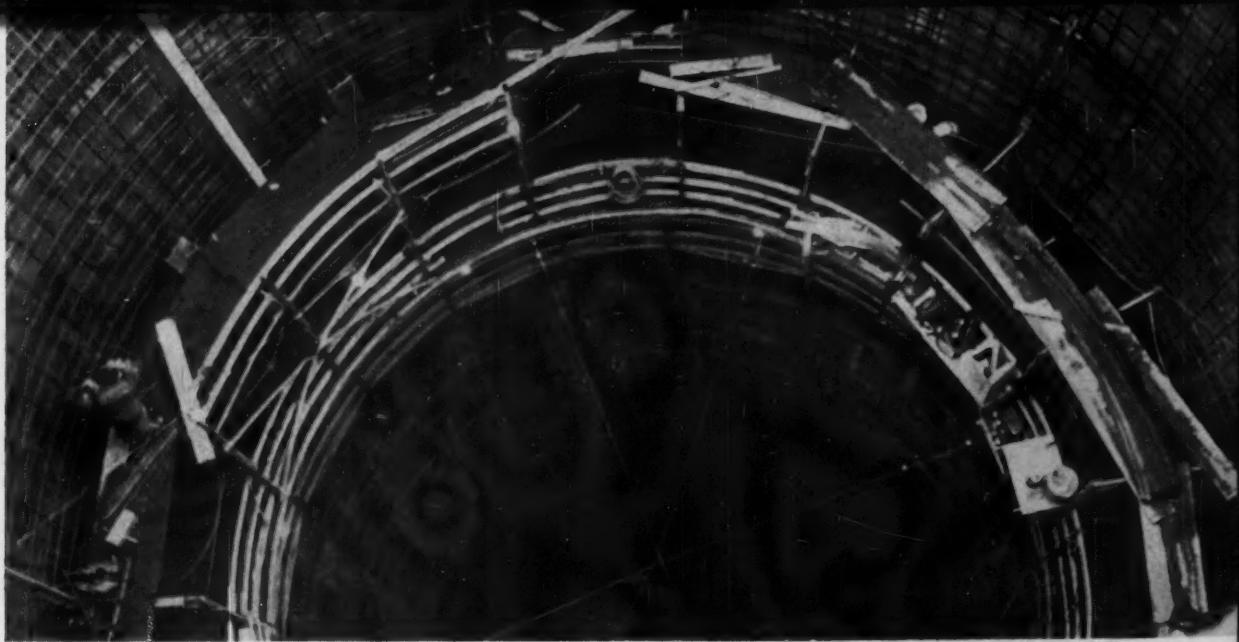
Groves bought these 10-ft-long strips ready-made from a local steel fabricator. They consist simply of a channel-shaped section supported on the subbase by sheet metal legs that hold it at the correct level. The three-man crew that installs the sections drives tubular pins through holes in the channel-shaped strip to anchor it in place against the side of the paving forms.

Groves leaves these keyway forms in after a pour because they figure that the loss of material is not enough to make up for the cost of stripping them. They would have welded the forms to the sides of the paving forms permanently, but plans call for the keyway only in certain slabs, not throughout the job. Dowel bars will splice together slabs adjacent to the taxiway.

Men on the Job

In charge of the \$4½-million job for Groves is superintendent Bill Chandler. Jack Healy is paving superintendent. Groves's engineer is Ronald Barnes. Superintendent for subcontractor Amos Barton is Fred Holzhauer. Resident engineer in over-all charge of all work at O'Hare for the consulting engineers, Naess & Murphy of Chicago, is Walter Mutschke.





SILO SLIPFORM—Circular, 41-ft-dia slipform moves up 120-ft-deep missile silo, guided by four vertical 2x6-in. rails. One rail is painted and marked as elevation guide.

Slipform Triples Rate of Pour On Missile Base Silos

Hundreds of small parts are accurately embedded in the concrete as this slip form moves upward at the rate of 4 ft every 6 hr.

SLIPFORMING has tripled the speed of constructing the underground silos for a Titan ICBM project at Ellsworth Air Force Base near Rapid City, S.D.

There, it took only three months to build a 41-ft-dia, 161-ft-deep silo that will store the missile until it is elevated to ground level for firing. By contrast, it took nine months to build similar silos with conventional forms at the Lowry AFB Titan project near Denver, Colo.

The Ellsworth job is the first large scale application of slip-forming at an operational missile base. It is proving so successful that it may well become the standard procedure in building underground missile projects. Hansen-Kashner Co. of Fresno, Calif., the concrete subcontractor

at Ellsworth, already has contracted for similar jobs at an Atlas project in Lincoln, Neb., and a Titan project at Mountain Home, Idaho.

Missile silo construction requires unusual accuracy. Laterally, the finished concrete cannot vary more than $\frac{1}{4}$ in. out of round. Vertically, it cannot be more than $\frac{1}{4}$ in. out of plumb in 10 ft.

In practice, the accuracy requirements are even tighter. There are more than 100 parts embedded in the interior walls of the silos. Included are such things as shock pads, brackets for counterweight guide rails, swivel lift brackets, brackets for a steel grillage at the silo bottom, and unistrut rings every 5 ft from which miscellaneous gear can be hung.

Tolerance on some of these embedded parts is $\frac{1}{8}$ in., which is less than the tolerance for the concrete itself. The easiest way to get everything within limits was to form the concrete to the more exacting tolerances.

Hansen-Kashner achieved this accuracy with a variety of controls on their slipforms that pre-



WORK LEVELS—Form carries three platforms. Top one is for steel setters, middle one is for the crew that places concrete, and the lower one is for the finishers.

MISSILE BASE SILOS ... *continued*

vented tilt, drift, and twist. For instance, they had:

- Four notches at the quarter points around the circumference of the form that guided the form as it moved up vertical 2x6-in. rails attached firmly to the



JACK CONTROL—One man controls all the jacks with a single valve. For each lift, the same amount of air goes to each jack so that they will lift the form evenly.

sides of the silo on the line of the finished concrete. The alignment of the rails was continually checked with wire-mounted 18-oz plumb bobs.

- Four reel-mounted plumb bobs suspended from the surface at quarter points around the form to detect lateral drift.
- A single control for the 18 air jacks that raised the form so that one shot of air actuated each one the same amount.
- A measuring pole at the side of the silo to chart the upward progress of the form.

The form assembly and its working platform was hung from the surface on eighteen 8-in. I-beams cantilevered over the edge of the hole. From the ends of the beams, 1-in. rods extended to the bottom of the silo. These rods passed through support points in the working platform.

To locate the embedded parts, a transit was set up on the floor of the silo at the previously determined center point. Sighting on quadrant points at the surface, the instrument turned off angles to set the alignment of the embedded parts. The elevation was measured from one of the 2x6-in. rails that had been painted and marked for use as a rod.

Concrete Placing

In spite of the accuracy required, crews placed concrete at a relatively rapid rate. The 120-ft-high shaft of the silo was poured in about nine days of round-the-clock operations.

Crews worked from a three-level platform inside the form. Most of the concrete was placed from the center level. The embedded parts were attached from this level also.

Above the main level was another level that served two purposes. It acted as a shelf for overhead protection of the main level. And workmen on it temporarily set embedded parts where crews on the main level could adjust and fix them in place as the form reached the parts.

The bottom level hung below the lower edge of the form so the concrete finishers could reach the exposed concrete.

Transit-mix trucks brought concrete to the silo from a central batching plant. It was poured into a $\frac{5}{8}$ -yd bucket and lowered to the working level where bugies transferred it to the form.

Preventing voids was a problem because of the heavy amount of reinforcing. By weight, the silos contain about as much steel as concrete. Size of the bars varies from No. 18 through seven sizes to $\frac{3}{4}$ -in. bars.

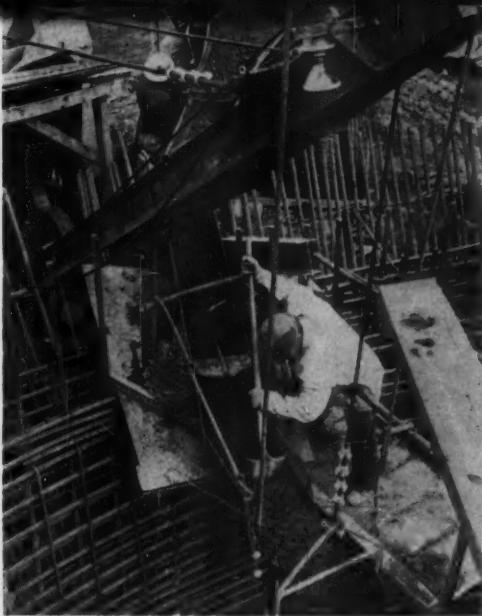
"We have bars on top of bars. The steel's so thick you can't see daylight through it," observed D. J. Bandy, project manager for Leavell-Scott & Associates of El Paso, Tex., prime contractors on the job. Crews with standard vibrators and a lot of patience worked the concrete around the reinforcing.

Concrete remained under the form only about 6 hr, or just long enough for it to attain its initial set. The 4-ft high form was lifted $\frac{1}{2}$ in. every 4 min by air jacks. The jacks were made by Pneumatic Jacks, Inc., of St. Paul, Minn.

Average ultimate strength of the concrete was 4,500 psi. Average slump was 2 in. Airin was added to provide air entrainment. Specifications for missile silos do not permit membrane curing; on this job, the contractor attached a perforated water hose to the bottom of the slipform to



SURFACE SUPPORT—Slipform is hung from 18 I-beams cantilevered over the hole. Entire base is being built in a 45-ft deep excavation.



PLACING CONCRETE—At the form, workmen with buggies transfer concrete from bucket to form.

DELIVERING CONCRETE—At the surface, a transit-mix truck chutes concrete into a $\frac{1}{2}$ -yd bucket.

keep the entire surface of the concrete wet.

The form consisted of vertical-grain, $\frac{3}{8}$ -in. T&G fir planking backed by two rows of double 2x6-in. walers shaped to provide the curvature. The form was constructed in four quadrants and held in place in the silo with a series of guy cables and turnbuckles.

The entire base is being built in a 45-ft cut that later will be filled in. The silos, which go down 120 ft below the grade of the cut, have to be built up to normal ground level.

The slipform handled about 17 ft of the above-ground section; the remainder was built with conventional forms.

Nine missile silos and nine 70-ft-deep, 40-ft-dia equipment terminals will be built by slipforming. Nine 37x40-ft propellant terminals will be built with conventional forms.

Slipform Advantages

According to Bandy, the slipform technique is about as expensive as regular forms. But it has other advantages.

One is speed. Conventional forms probably would have been built in 16-ft lifts. At a rate of one pour a week, it would have taken 10 weeks to pour a silo. The slipform took two weeks.

Another advantage is reduction of the amount of forming. The slipform requires the building of only 500 sq ft of form. Lift forms would have required 15,000 sq ft per silo. And because of the tight schedule, all silos

have to be built at the same time, so separate forms are needed for each.

The slipform also eliminates the need for scaffolding and internal ties.

The \$48-million Ellsworth project is the nation's second operational Titan base. It is scheduled to be finished in December, 1961.

The major contract of \$28.5 million for the brick and mortar portion of the job is held by Leavell-Scott Associates. Members of the group are C. H. Leavell & Co. of El Paso, Tex.; Paul Hardeman, Inc. of Stanton, Calif.;

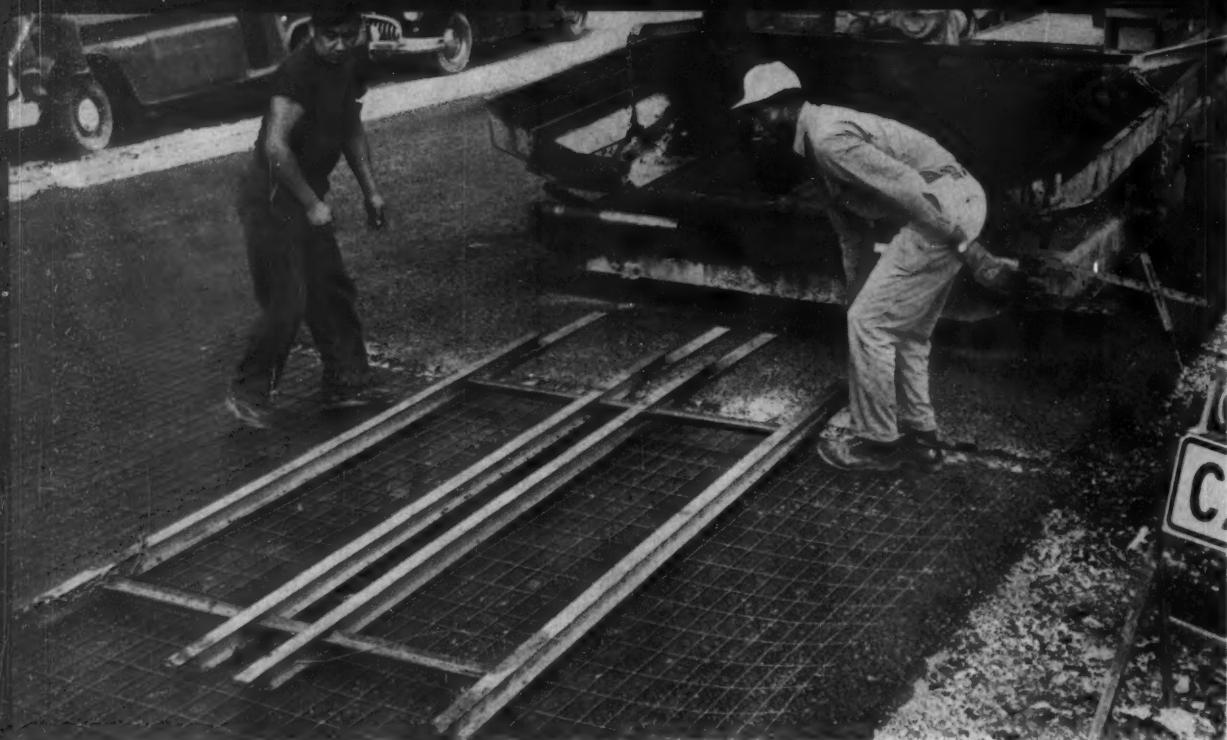
Morrison-Knudsen Co. of Boise, Idaho; MacDonald Construction Co. of St. Louis, Mo.; F. E. Young Construction Co. of San Diego, Calif.; Olson Construction Co. of Lincoln, Neb.; Johnson, Drake & Piper, Inc. of Minneapolis, Minn.; and the Scott Company of Northern California, of Oakland, Calif.

Men on the Job

The Omaha District of the Corps of Engineers, under Col. David G. Hammond, is supervising construction. D. J. Bandy is in charge for Leavell-Scott. Hansen-Kashner work is under the direction of Roy Kashner.



BUILDING THE FORMS—Forms are fabricated in quarter-circles. Pairs of double 2x6-in. curved walers back $\frac{3}{8}$ -in. T&G fir flooring.



Paver Rides High as Sled Holds

A sled that holds down the reinforcing mesh and a throttle on the paver engine that permits gradual changes in speed make this contractor look good on his first reinforced asphalt paving job.

NOT MANY CONTRACTORS have experience with reinforced asphalt paving. Callanan Road Improvement Co. of South Bethlehem, N. Y., was no exception until they won a \$150,000 contract for improving a 1½-mi stretch of Route 44 near Poughkeepsie.

But their first fabric-in-asphalt job went like clockwork, thanks to two job developed tricks: a sled to keep the reinforcing fabric from tangling in the paver and a "decelerator" to keep the paver itself from slipping on the mesh.

The job called for widening the 18 to 20-ft concrete highway to 24 ft and resurfacing the old pavement with reinforced asphalt. Callanan thought they might have trouble while placing the 1½-in. binder course that contains the mesh. The problem was how to iron out the sheets of mesh and keep them from getting caught in the paver's distribution screw.

Here's what they did. They made a sled consisting of four 10-ft-long 3-in. channels connected transversely by 2-in. angles. It fitted easily beneath the paver, in between the tracks, with about 6 in. clearance on either

side. Chains attached to the forward end of two of the runners held the sled in position. Hooks at the front end of the paver made the chains adjustable so the sled could be shifted as required.

Dragged along underneath the paver as it moved forward, the sled would hold down the mesh and permit the paver to run over it without getting its conveyor screw tangled—or so they hoped. Rails also made up of 3-in. channels—one on each side of the paver—were to be dragged along about 6 in. outside the tracks to hold down the edges of the sheets.

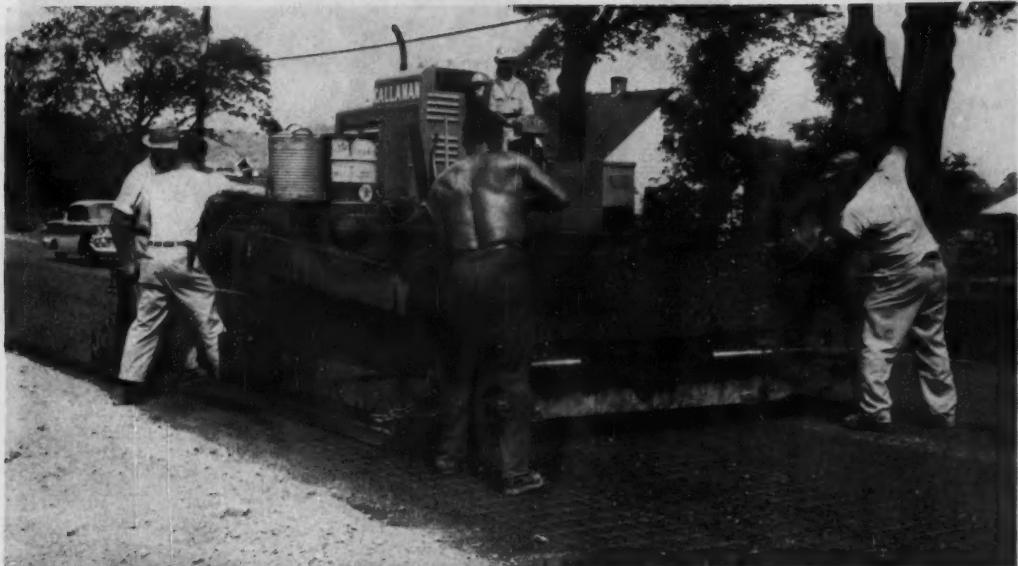
In a trial run the day before paving was to start in earnest, Callanan found that the sled was not quite long enough to hold the mesh down directly under the conveyor screw. So they decided to extend it so it would reach completely under the screw to within about 2 in. of the screed. They made the alterations that night, welding a ¼x3-in. plate to the rear end of each channel runner. This extended runners and rails an additional 3 ft.

The next day the paver rode over the wire mesh without mis-

hap and placed about 500 tons of hot mix asphalt. The sled worked perfectly. Only trouble was that the rails at each side of the paver were not heavy enough. But with a workman standing on one end they succeeded in holding down the sides of the sheets. If Callanan had it to do over again they would beef up the rails; otherwise they are well satisfied with their system.

Their paving performance was all the more remarkable because previous experience by other contractors had indicated that 1¼ in. was about the minimum practicable thickness of a course designed to be placed with wire mesh reinforcing.

Careful attention to detail is what made it possible. For instance, Callanan made a small but highly effective modification to their Cedarapids Model BSF-2 paver to fit it to job conditions. The gasoline powered paver's speed is controlled electrically by micro-switches. The operator simply flicks the switch to any desired setting between 11 and 189 ft per min, and that regulates the speed of the tracks. (Cal-



PAVER ROLLS SMOOTHLY—After trial run to iron out kinks, contractor makes a good start by placing 500 tons of asphaltic concrete the first day.

Mesh

lanan ordinarily operated the paver at about 65 ft per min.)

Because an abrupt rise in paving speed might cause the paver to slip over the reinforcing, Callanan designed and installed a "decelerator." This was simply a spring-tensioned, pedal-controlled throttle in the gas line which, when pressed by the operator, decelerated the engine gradually to idling speed. Similarly, to accelerate evenly when starting, the operator first depressed the pedal before flicking the micro-switch to the desired speed setting. Then he slowly let out the pedal to pick up speed smoothly.

As a further precaution against slipping, the contractor's crew scattered hot mix over the steel fabric in front of the tracks. No trouble developed, even when sheets of mesh were turned over so the transverse wires were sticking up. Sometimes the sheets lay flatter this way, but it is contrary to common practice. Ordinarily sheets are laid so the longitudinal wires are uppermost. In this case it didn't make much difference.

CHAIN HOLDS RAIL—At each side of paver 3-in. channel rail holds down mesh.

Where necessary — for example when the paver was about to move onto a first sheet of wire fabric in a reinforced section—the edge of the sheet nearest the paver was secured to the underlying course with concrete nails.

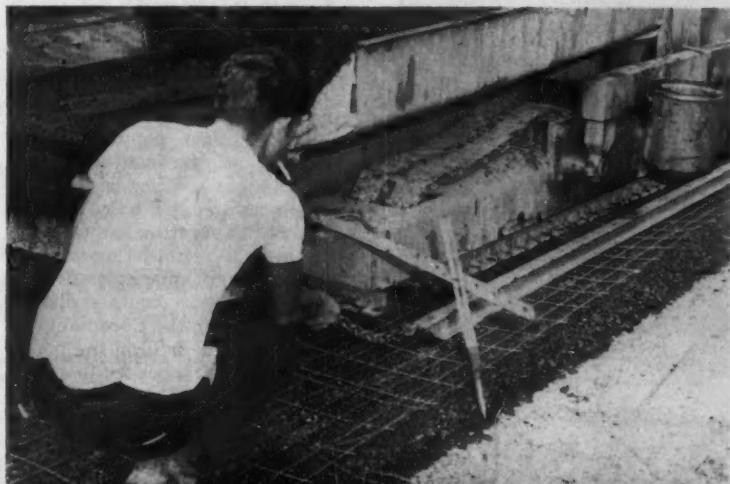
The welded wire mesh consisted of 13-ft-long sheets of 3x6—10/10 fabric placed side by side without overlapping across the 24-ft width of pavement. Except for certain experimental sections, three sheets varying in width from 7½ to 8 ft did the job. Highway engineers left some sections unreinforced as a control to see if transverse cracks in the old pavement would be reflected in the asphalt resurfacing where it was not reinforced.

Callanan completed the paving in just 14 days, laying a total of

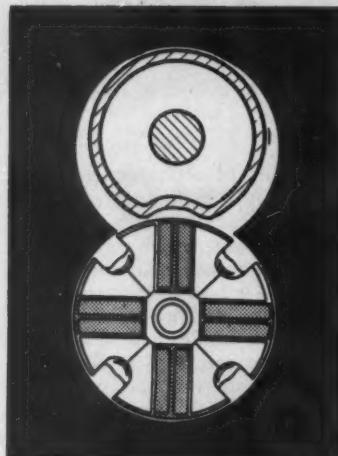
6,000 tons of asphaltic concrete. Two Buffalo-Springfield rollers of 10 and 12 tons capacity compacted the courses, which consisted of a 1½-in. evener course in some locations, a 1-in. top course, and the 1½-in. binder course.

Both the binder course and the top course consisted of Type IA asphaltic concrete. Maximum size of stone in the binder course was ¾ in.; those in the top course were a maximum ½ in. The Dutchess Quarry and Supply Co. of Pleasant Valley, N. Y., supplied the hot mix.

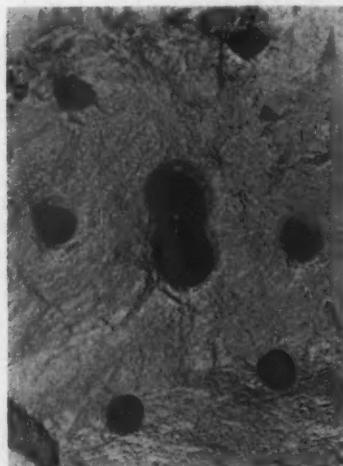
Superintendent in charge of the job for Callanan was George Williams. Resident engineer for the state was David P. McCoy. Assistant District Engineer is M. N. Sinacori. District Engineer is Kurt G. Rauer.



Working with air-leg rock drills and special accessories that insure drilling accuracy, contractors can make a new type of burn cut to get better results when blasting rock.



HOLE PATTERN—Two holes make up the unloaded center in the Coromant cut. Top hole was drilled first; when drilling second hole, the bit follows a grooved guide tube inserted in the first hole. Later, templet helps position drill for other holes.



Drill Templet Helps Make Accurate Burn Cut

TUNNELERS working in rock now can get greater advances per round with a new drilling technique developed in Sweden. The method is especially suited for drilling in small drifts with lightweight rock drills supported on pusher legs.

Atlas Copco, a Swedish rock drill manufacturer, and the Sandviken Steel Works Co., Ltd., of Sweden developed the new drilling method, known as the Coromant cut. It is recommended for drifts up to 10x12 ft where advances of 8 ft or more per round are required. Maximum advances of 13 ft per round have been achieved with this method.

Basically, the Coromant cut is a burn cut. It was evolved from the Michigan cut, popular around the turn of the century. The Michigan cut utilizes a 3 1/4-in.-dia unloaded center hole, but the Coromant cut features an unloaded center slot consisting of two or more 2 1/4-in.-dia holes drilled closely together. Another distinguishing item of the Coromant cut is a templet for drilling the holes. It insures good accuracy in start-

ing and drilling the various parallel holes for this type of a burn cut.

Researchers working on this drilling method first tried several 2 and 3-in.-dia holes for the unloaded center slot, but they had difficulty drilling two parallel holes close to each other. To improve accuracy, they devised a special guide tube for drilling the second hole for the slot.

The guide tube is a rolled section of pipe, approximately 2 in. OD with a 1/16-in.-thick wall. It is fitted with an expander at one end. The action of the expander is similar to that of a mine roof bolt, but in this case it keeps the guide tube from twisting rather than from coming out of the hole.

Here's the procedure. A driller first sinks a single hole as accurately as possible with a drill mounted on an air leg. This hole is inclined upward about 5 deg to help remove the cuttings. Once the hole is completed, the guide tube is inserted into it with the expander locking it in position. If the first hole is somewhat twisted or deflected from its intended path, an air leg can be used to push the guide tube into the hole. Then the driller com-

HOW TO HANDLE WET JOBS

#56 of a series

Project: McMillan Street Pumping Station, Jacksonville, Fla.

General Contractor: The Auchter Company

Engineers: Metcalf & Eddy, Boston, Mass.



Slopes withstand torrential rains as wellpoints ...

Control 32' of Water in Sand and Porous Limestone

Many contractors know from hazardous experience that porous limestone at subgrade is a "tough nut" soil to dewater. Compounding that problem, the property limits of this site were so close to the excavation area that open cutting would require steep slopes in the overlying sand. It seemed questionable whether the slopes could withstand the heavy Jacksonville rainfall.

• Steel sheeting mandatory? Though many thought so,

The Auchter Company was confident that, with proper handling of the ground water and surface run-off, it could open cut the excavation.

• Auchter called for a Griffin wellpoint system to control 32 ft of water in this tricky soil. Plastic sheets were placed at pump stations to prevent undermining by the torrential rains. Photo shows subgrade dry and slopes stable ... another successful dewatering job by Griffin.

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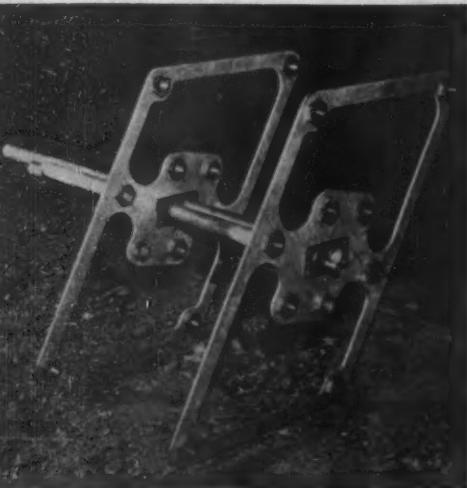
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DRILL TEMPLET . . .

continued



TEMPLET—Ten-hole templet, found to give best results, is mounted on two pipes that fit the unloaded center slot. Original templet was solid plate with only six holes.

pletes the center slot. The drill bit follows a groove in the guide tube and produces a second hole exactly parallel to the first one and slightly overlapping it. When this is completed, the guide tube is no longer needed and it is removed.

Next the drillers position the templet for drilling the remaining holes of the Coromant cut. The templet is made up of two plates mounted about 2 ft apart on two steel tubes that are welded together and fitted with an expander similar to that for the guide tubes. The tubes are pushed into the open center slot until they are firmly seated with one plate of the templet resting against the rock face to be drilled.

Holes in the templet correspond to the desired drilling pattern for the burn cut. The hole arrangement can be varied easily by changing the steel plates. All holes are fitted with replaceable bushings. At first the developers tried drilling six holes for the cut, but they soon found that adding four more holes improved the blasting. And the templet was modified to include the additional

holes at the corners of a four-sided frame around the templet.

Equipment for the drilling tests included the following: an Atlas Copco BBC22 rock drill; Sandvik Coromant $\frac{7}{8}$ -in. drill rods with $\frac{7}{8} \times 4\frac{1}{4}$ -in. shanks and conical tapers; and Sandvik Coromant 2 $\frac{1}{4}$ -in. special detachable bits with taper and small flushing grooves. A conical connection between bit and rod was found to be best for obtaining satisfactory wearing life from the equipment.

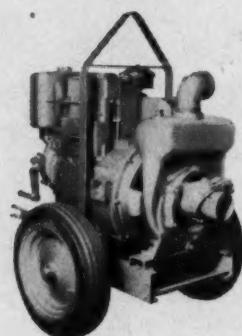
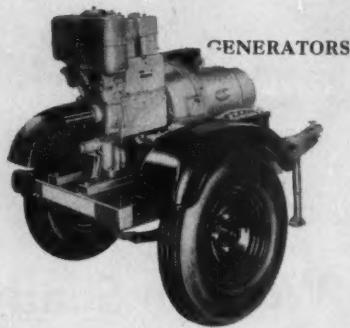
During the tests the drillers obtained an average advance of 10 ft per round, but successful results were achieved with a hole depth as great as 13 ft. For this depth, they blasted against an unloaded center slot consisting of three 2 $\frac{1}{4}$ -in.-dia holes drilled closely together. The average advance was 12 $\frac{1}{2}$ ft.

Main advantage of this drilling method and the Coromant cut is a longer advance per round in a small cross-sectional area. This makes it easier to plan the advances to suit the working cycle or length of shift. And, with the templet, even unskilled drillers can obtain satisfactory results.



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FULL POWER EJECTION

Only Allis-Chalmers all-hydraulic motor scrapers give you two-stage hydraulic ejection teamed up with the highest apron opening in the business.



The new hydraulic 340-hp TS-360 gives you a *full 10-ft. opening* from cutting edge to apron at full raise . . . higher than any other unit. With *double-barreled hydraulic power* the 360's twin telescoping cylinders spread heaped loads without interference . . . without slowing down the cycle. Let your Allis-Chalmers dealer show you *any* Allis-Chalmers motor scraper working side by side with any other unit of *your choice*.

Bring your stopwatch, prove to yourself that Allis-Chalmers *full power ejection* is unequalled for fast, smooth spreading.

**ALLIS-CHALMERS ALL-HYDRAULIC
MOTOR SCRAPERS**

Smooth, even spreading

10 to 30 yds heaped...155 to 40 h



FULL POWER PENETRATION

Only Allis-Chalmers all-hydraulic motor scrapers give you double-acting bowl jacks that penetrate for faster loading, controlled digging.



Exclusive hydraulic down pressure on the cutting edge permits quick penetration into the toughest-loading materials. Penetrating force like this—along with Allis-Chalmers' original low, wide bowl—gives you fast, heaped loads every pass. Operators go for this precision bowl control in a big way. You will too, when you see the results.

For definite proof, compare Allis-Chalmers performance with any other motor scrapers—in any cut . . . regardless of material.

**ALLIS-CHALMERS ALL-HYDRAULIC
MOTOR SCRAPERS**

Fast, controlled loading

horsepower...

TS 160

TS 260

TS 360

FULL POWER TRACTION

KON-TORK differential provides every Allis-Chalmers motor scraper with full-time traction magic. You get all-weather production to help meet tight schedules.



KON-TORK differential works automatically. In the cut, on the haul or soft fill, it helps boost cycle time by automatically controlling the transfer of torque to each drive wheel... giving you full benefit of *maximum tractive effort all the time*. Another nice thing about KON-TORK differential is that it's simple. Its five moving parts require no adjustment.

ALLIS-CHALMERS ALL-HYDRAULIC MOTOR SCRAPERS

Steady production...even in mud

ONLY ALLIS-CHALMERS MOTOR SCRAPERS

*give
you*

FULL POWER

... in every phase of the cycle

TS 160

TS 260

TS 360



FULL POWER TRACTION
FULL POWER PENETRATION
FULL POWER EJECTION
FULL POWER STEERING

Steady production... even in mud

Only Allis-Chalmers all-hydraulic motor scrapers give you **FULL POWER STEERING**

from here X

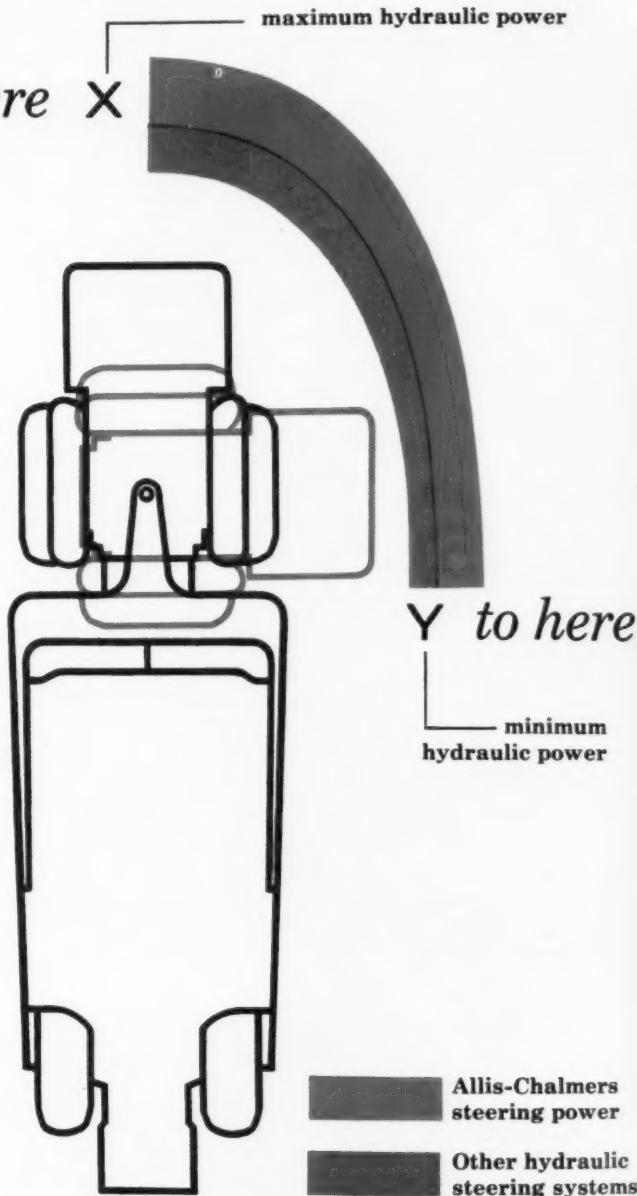
maximum hydraulic power

HERE'S HOW

- 1 **Fast, 180-degree, non-stop turning** in less than machine length with only one-sixth turn of the steering wheel.
- 2 **Faster recoveries** from full 90-degree turns than any other motor scrapers.
- 3 **Double-acting hydraulic response** to match any situation in every phase of the cycle.

Only Allis-Chalmers motor scrapers can provide you with these exclusive advantages.

As illustrated in the graph, Allis-Chalmers hydraulics provide more turning power at point Y—the *low power point in any steering system*—than most other motor scrapers have at point X, *the point of maximum hydraulic turning effort*. The reasons: Allis-Chalmers motor scrapers provide independently powered hydraulic steering systems. And Allis-Chalmers advanced engineering has resulted in a hydraulic system which is the standard of the industry.



155 to 340 horsepower....

10 to 30 yards heaped....

all hydraulic....

Here's how full-power

penetration puts enough force on the cutting edge to pivot this load clear of the ground. Only through the outstanding durability which is built into every Allis-Chalmers seal, hose, jack, valve and pump... can superior loading performance be realized day after day. The story is one of precision engineering and machining... quality materials... constant testing... and never-ending hydraulic research.



Here's how KON-TORK

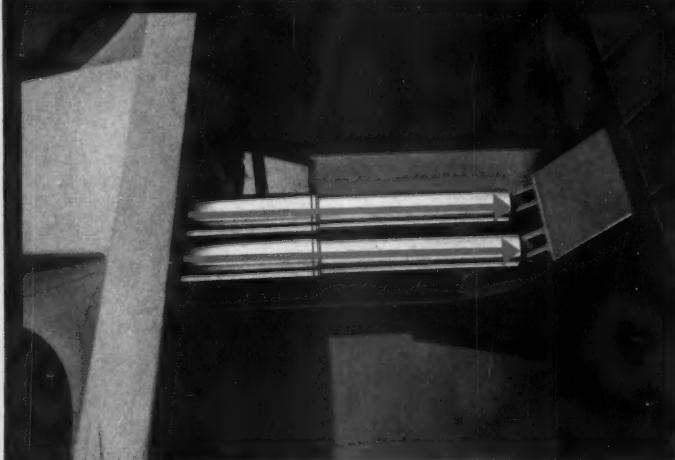
differential works for you every minute of the day. Whether you're loading, hauling, or spreading... you always benefit from the traction boost of KON-TORK differential. As footing conditions vary, tractive requirements are met automatically through KON-TORK differential's smooth transfer of power from wheel to wheel.

KON-TORK differential's simple, rugged design utilizes only five moving parts which require no adjustment. Try full-power traction on your job soon. You'll quickly see its big benefit—building up fast on the fill.



Here's how full-power

ejection assures speedier fill work. Telescoping hydraulic rams provide two-stage ejection power. The first—and most powerful—stage forces the whole load forward. The second faster stage kicks out the remainder of the load clean as a whistle. It's no wonder Allis-Chalmers motor scrapers give you fast, even lifts every pass with full-power ejection... with up to 2 ft. more apron lift than any comparable-sized units.



Quick, controlled loading

to

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34

15

Allis-Chalmers
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ALLIS-

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KON-TORK is a

You can't afford
to pass up **FULL POWER**
EARTH-MOVING PERFORMANCE.

Pick a date for a demonstration now...
with the all-hydraulic machine
that fits your needs best!



340-HP 22.3 TO 30 YD



230-HP 13.5 TO 18 YD



155-HP 7.5 TO 10 YD

Allis-Chalmers motor scrapers have proved their capabilities on thousands of jobs ranging from superhighways to simple, single-unit striping jobs. You owe it to your investment and your future to appraise the industry's only full-power motor scraper line.

Only performance puts profit in your pocket... look beyond the paint when choosing your next modern earth mover. Your Allis-Chalmers dealer will be out to demonstrate on your job... can help finance your equipment... will back you up with service that satisfies.

ALLIS-CHALMERS CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Move ahead with **ALLIS-CHALMERS**
... power for a growing world





Hot-mix Texaco Asphaltic Concrete pavement is speedily laid on 11 miles of Nebraska State Highway 61. No time-consuming curing period is required.

Nebraska builds Asphalt highway for hauling wheat crop

This 11-mile section of State Highway 61 passes through Nebraska's fertile wheat growing country. At harvest time, heavy trucks loaded with grain use the highway to reach elevators and rail heads.

The pavement constructed on this heavily traveled route consists of three inches of heavy-duty hot-mix Texaco Asphaltic Concrete, laid on a six inch granular base. The Texaco Asphaltic Concrete was placed in two courses, a 1½ inch binder course and 1½ inch wearing surface. Nebraska used an asphalt cement with a 100-120 penetration in the pavement mix.

This Texaco-paved State Highway combines rugged durability with a moderate first cost and low upkeep cost. It is speedily laid, since it requires no time-

consuming curing period. Because of its resilience and freedom from expansion joints, it has a velvet-smooth riding surface which is appreciated by truck drivers and motorists alike.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils provide the road builder with a wide choice of heavy-duty, intermediate and low-cost types of paving for highways, streets and airports. Whatever your paving project, one of these types is exactly suited to your requirements. For helpful information on all of these Asphalt types, mail the coupon below for the two Texaco brochures. There is no obligation.

Contractor: NORTHWESTERN ENGINEERING COMPANY

TEXACO INC., Asphalt Sales Div., 135 E. 42nd Street, New York 17
 Chestnut Hill 67, Mass. • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 1
 Minneapolis 3 • Philadelphia 2 • Richmond 25



TEXACO ASPHALT

Please send me your two brochures containing helpful information on heavy-duty, intermediate and low-cost types of Asphalt construction for highways, streets, airports, etc.



TEXACO INC., Asphalt Sales, 135 East 42nd Street, New York 17, N.Y.

Name..... Position.....

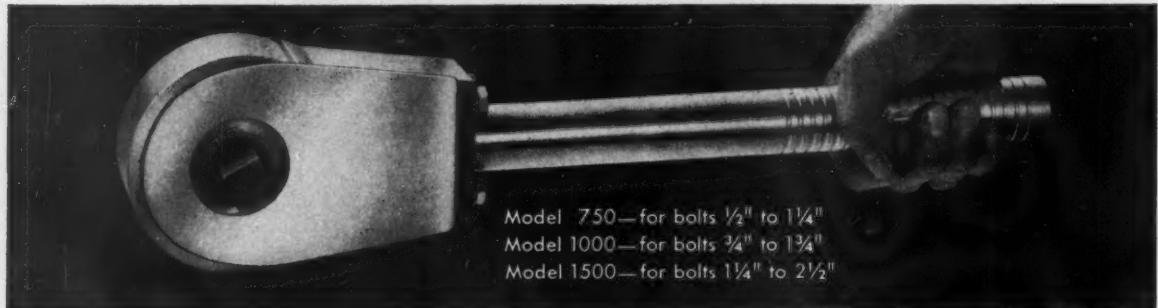
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Address.....

designed to solve a universal maintenance problem ...

**first manual impact wrench that works ...
LOOSENS THE TOUGH NUTS
EVEN POWER WRENCHES CAN'T BUDGE!**

SWENCH®



• Loosens "frozen" nuts in seconds • Tightens nuts to maximum practical tightness

There's never been anything like Swench before. It is an entirely new concept in wrench design. Swench is the world's *only manual impact wrench*. Here's what Swench means to you ...

NEW SPEED—Nuts that previously had to be burned off can now be "Swenched off"—with unbelievable ease—by *one* man—in a matter of minutes.

NEW EASE—Only Swench in its torque class is truly portable . . . lets you take the wrench to the job—*anywhere*—with no auxiliary equipment, no power connections.

NEW SAFETY—With Swench there's no back-breaking, knuckle-knocking struggle . . . no dangerous handle extensions



See for yourself! Swench is so different from anything you've experienced, you'll have to see it in action to believe it. For a quick and convincing demonstration, contact Marquette.

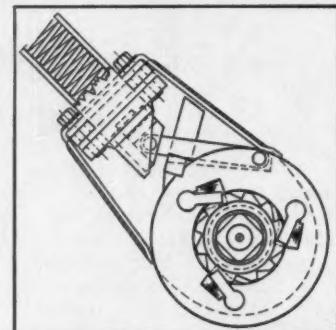
... no sudden release of a frozen nut . . . no shock transmitted through the handle.

NEW POWER—Swench, size for size, gives greater—and more effective—torque than power wrenches . . . multiplies torque applied to handle over 1500% (yet all Swench's power is built into the wrench itself).

NEW ECONOMY—Swench saves in many ways . . . no auxiliary equipment to maintain and man, no costly upkeep on the wrench, no man-hours fighting frozen nuts—and Swench costs less than half as much as wrenches with comparable impact power.

NEW VERSATILITY—One Swench can handle more bolt sizes than any power wrench . . . loosening or tightening requires no special adjustments.

NEW TENSIONING ACCURACY—Precise tightening is assured with Swench, following simple instructions.



INSIDE STORY—How is all this possible? Unlike power wrenches that deliver many tap-like blows, or ordinary manual wrenches that apply steady torque, Swench builds up power in its super-strong spring for a mighty wallop that is released as torsional impact every time the handle is advanced slightly more than 30 degrees.

Write for further information.

*"When you're up against the tough nuts . . .
Don't wrench it . . . SWENCH IT!"*

MARQUETTE DIVISION

CURTISS  **WRIGHT**

CORPORATION • 1165 GALEWOOD DRIVE, CLEVELAND 10, OHIO

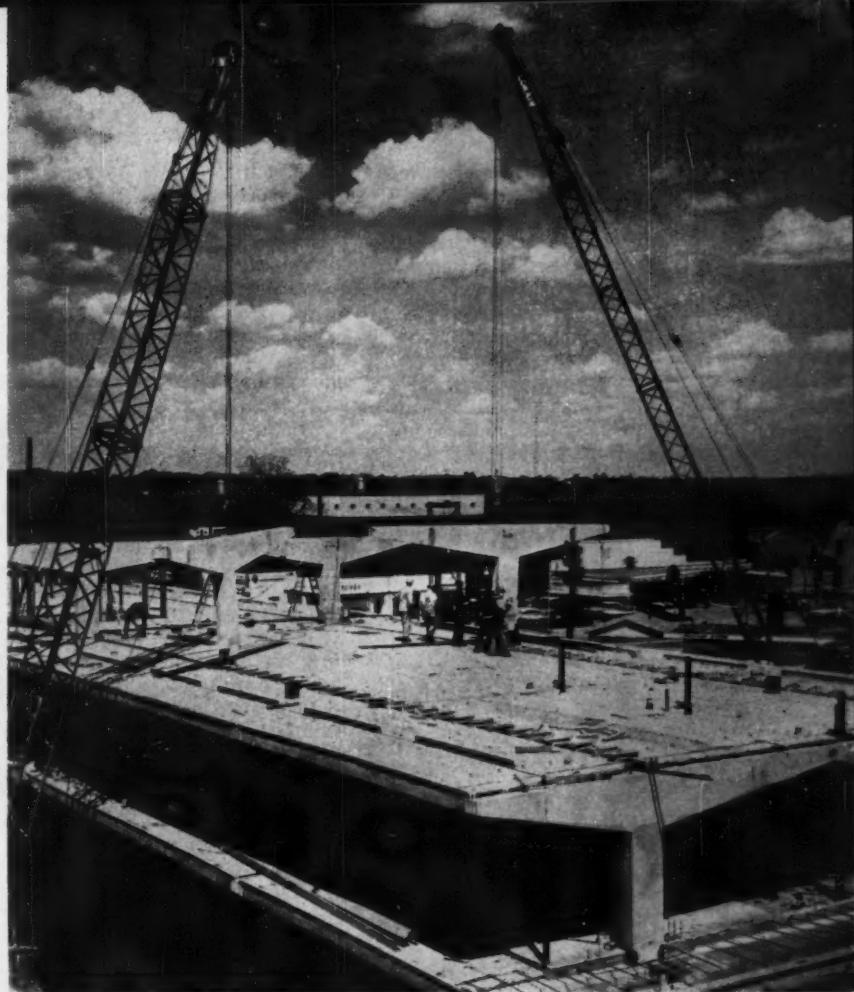
Precast concrete tees tied together in tiers by epoxy bonding compound and dowels welded to plates cast in their base form the frame of this motel.

STANDING in two orderly rows with arms outspread like soldiers doing calisthenics, precast concrete tee frames placed in pairs hold the prestressed double-tee floor planks of a motel in Macon, Ga., that features a frame made up almost entirely of precast elements.

An epoxy bonding agent forms a bearing pad that splices together the tiers of tee frames. After placing the bonding compound, the contractor erects and plumbs a pair of tees; then welders tie together dowel bars and reinforcing that complete the knitting of the joints.

There are seven pairs of tee frames on each of the five floors of the building, making a total of 70 tees. Each consists of a column, measuring $1\frac{1}{2} \times 2$ ft in section, with arms jutting from the top at both sides. Depth of the arms tapers from 3 ft at the column to 10 in. at the ends.

The frames are not symmetrical. The inner arms of each pair meet at the center of the build-

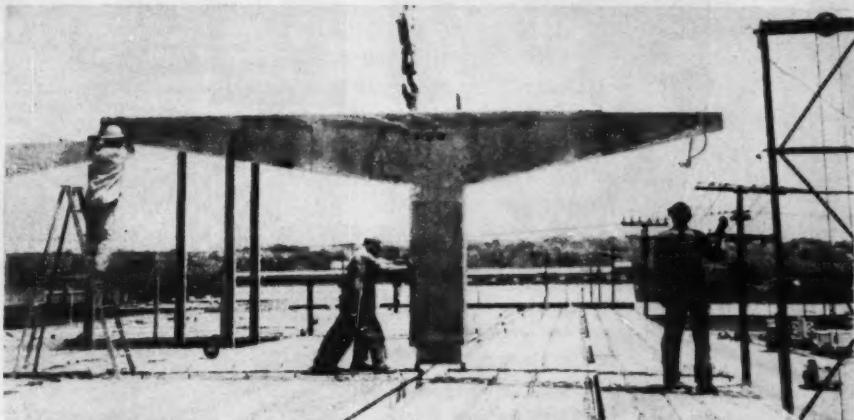


PLACED IN PAIRS—Two Lorain truck cranes team up to erect a pair of precast tees. Prestressed double-tee floor planks span 26 to 31 ft across the six bays between tees.

Tiers of Tees Tower Five Stories



BUTTER BASE—Workmen apply $\frac{3}{4}$ -in.-thick layer of epoxy bonding compound that acts as bearing pad and splice.



DROP INTO PLACE — Erection crew guides one of half-ton tees into position.

TIERS TOWER FIVE STORIES . . . *continued*

ing to form the crown of an arch that spans 28 ft center to center of columns. The outer arms cantilever 11 ft from the columns. Frames in the first floor level are 12½ ft high, others in the upper floors are 10 ft.

Dowel bars are welded to steel plates cast into pockets at the bottom of each column to anchor the frames. Cast-in-place beams spanning the bays tie the columns of opposite frames together and provide lateral support to resist wind loads. Prestressed double-tee floor planks also span between pairs of frames. A 2-in.-thick

concrete floor slab caps the planks.

Contractor H. G. Tinker, of Macon, erected the half-ton frames a pair at a time with two Lorain truck cranes. But first workmen applied a ¾-in.-thick buttering of Sika epoxy compound to each placement position. This aided bearing and provided a strong bond between concrete surfaces.

When the layer of epoxy had been spread, the cranes lowered the tee frames into position. One crane was stationed in the adjacent street and the other in a parking lot at the other side of the building. Before releasing the crane hooks, the crew tied the frames together and guyed them with cables tightened by turnbuckles. They then plumbed the frames by adjusting the guys.

As soon as a pair of tees were plumbed, a welder connected the four steel dowels (extending up from the column below) to two ½-in.-thick, 8x10-in. steel plates embedded in the sides of the column base. Next the welder, using a 250-amp Hobart welding unit, joined steel inserts at the ends of the tees' inner arms with 2x4-in. steel tie plates.

The crew erected the 14 frames for the first floor in just two days. They then began placing the prestressed double-tee floor planks that span the six 26 or 31-ft bays between frames. The 14½-in.-deep planks have a 2-in.-thick flange. They vary in width from

2½ ft to 4 ft, and average about 5,000 lb in weight.

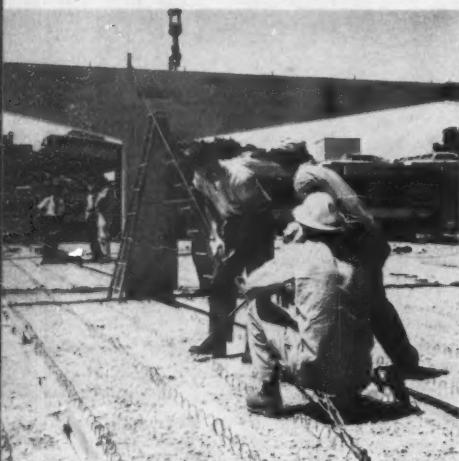
Working with two four-man crews, the two Lorain cranes placed as much as 4,300 sq ft of the floor planks in a single day. With slings attached to four pick-up points per plank, the cranes snatched the double-tees directly from the beds of delivery trucks. In placing the planks the crews worked from the center of the building outward.

Tie Beams Link Tees

After placing all planks for the first floor, Tinker spent half a day pouring the tie beams spanning between columns. Special planks with one stem flush to the edge acted as side forms for the 12x15-in. beams. The soffit form consisted simply of plywood hung by a single row of snap ties from 4x4's about 2 ft long laid across the gap between planks.

A three-man crew poured one beam at a time with a Prime Mover buggy fed by a Jaeger hoist tower. Each beam took about 9 yd of 3,000-psi concrete.

Project manager in charge for H. G. Tinker Construction Co. on the \$650,000 structure was R. E. Leverette. Macon Prestressed Concrete Co. supplied the precast frames and the prestressed floor planks. Architect and owner of the new motel is Bernard A. Webb, of Macon. The engineer who worked out the structural details is Demetrios A. Polychrone, Atlanta.



PLUMBING—Crew tightens turnbuckles on guy cables to plumb tees to final position.



WELDING—With tie plates, welder connects steel inserts cast in ends of arms.



FORMING—Soffit form of 12x15-in. tie beam hangs from 4x4's between planks.



WORKING IN MUD...

DW21s push tough excavation job

Put yourself in the shoes of Grantwood Construction Co., Kirkwood, Missouri. The job—excavate 425,000 cu. yd. for the River Roads Shopping Center, St. Louis. Average haul distance—900-ft. round trip.

Here's the dark side of the picture. Bad weather turned the silt and clay into heavy, slippery muck. And the rains continued, throughout the spring.

Adverse conditions? Definitely! But the two DW21Gs took them in stride, moving big loads over soft ground.

Three features on the DW21G paid off big:

SYNCHROTOUCH TRANSMISSION CONTROL: It lets the operator shift simply by dialing the desired gear for automatic, split-second response. Result: faster shifting, faster cycles, more payloads per hour, less operator fatigue for higher daily production.

POWER: DW21G is rated at 345 HP (maximum output) . . . plenty of power to get heavy loads out of the cut . . . hustle them over soggy ground.

GOOD FLOTATION: Wide-base tires on tractor and matching 470B Scraper carry big loads over ground that bogs down other rigs. 470B is rated at 19.5 cu. yd. struck . . . 27 cu. yd. heaped. Other features add up to lower maintenance cost; longer, more productive service. For example, strong bowl, draft frame and apron shrug off the punishment of heavy loads.

The DW21G delivers top performance on any job . . . especially the tough ones. Your Caterpillar Dealer has complete details on this versatile scraper combination. Ask him to demonstrate its profit potential on your job.

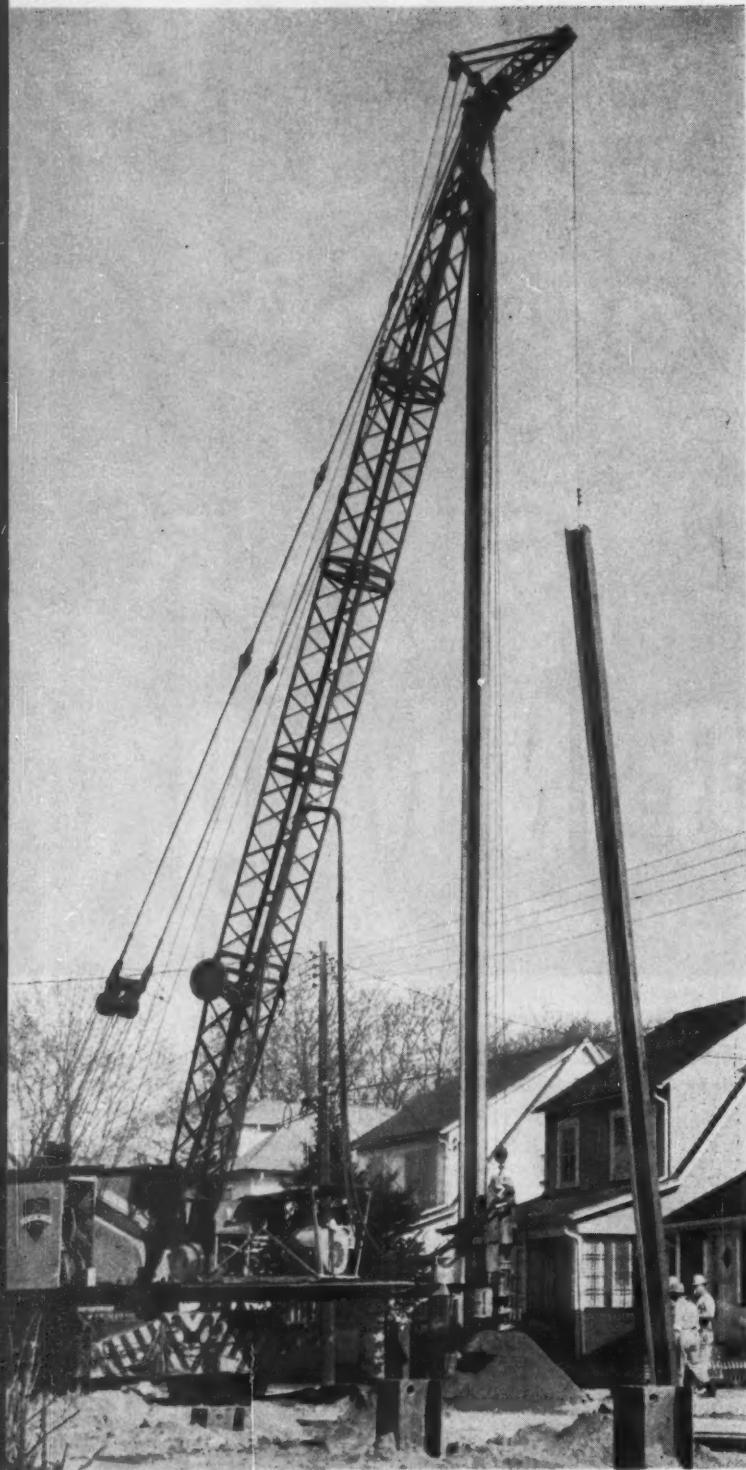
Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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**WANTED—
THE HARD WORK**

Common Trench



PRE-BORING RIG — Auger and lead hang from boom tip while jib holds soldier beam. Platform under the boom mounts hydraulic pump.

PROPER ALIGNMENT — Soldier passes into hole through light guide frame that positions it. Workmen grip opposite end of frame to move the beam easily.



CLEAN HOLE — Sleeve with conical flange fits around auger, spills dirt away from the hole.



Makes Common Sense on Sewer Job

There's little orthodox about the way this contractor is building three parallel sewers. Instead of three trenches, they are digging one. Instead of driving, they are pre-boring for soldier piles. Net result: a neat and economical job.

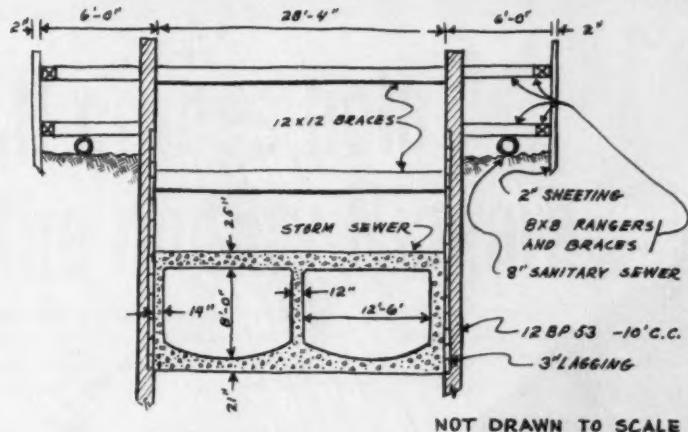
IN TODAY'S TIGHT BIDDING situations it's unusual when a contractor comes in \$700,000 low on a \$5.5-million bid. T&T Contracting Corp. of Brooklyn did just that when they won a contract to construct three 12,000-ft sewer lines in New York City's densely populated Borough of Queens. But T&T isn't crying about the money they left on the table. They stand to make a good profit as things are.

A look at the way T&T is handling the job gives the reason why. They are building a double-barreled reinforced concrete storm sewer and installing two sanitary sewer pipes in a common open cut trench rather than in three separate ones.

The design calls for a storm sewer at a maximum depth of 34 ft, plus sanitary sewers that flank the storm sewer at a depth of 12 ft. The project takes in the entire 30-ft-wide roadway and 5-ft-wide sidewalks of a residential street. Working space is at a premium; there is 9 ft between the edge of the project and the property lines, and homes are setback as little as 10 ft farther.

T&T figured there were two ways to handle the job. One way was to work from the center of the street to dig out the sanitary sewer trenches at either side. After installing the sanitary sewer pipe and backfilling, they could work from the sides of the street to excavate the wider and deeper trench for the storm sewer. While this procedure solved the working space problem, it had one major drawback: it required separate sheeting for each trench.

The alternate method, calling for a common trench, required moving the sanitary sewers 3 ft inward toward the storm sewer.



T&T assumed correctly that the Borough would consent to the relocation, which helped the contractor in two ways. It gave them a 9-ft leeway alongside the trench to maneuver light equipment and materials. And it put the sanitary sewer close enough to the storm sewer to make a common trench feasible.

By choosing the common trench, T&T cut in half the amount of temporary sheeting required for the sanitary sewer trenches, and reduced by one-third the quantity of permanent lagging needed for the storm sewer trench. The difference in the bid prices between T&T and the next higher bidder is reflected mainly in the savings in sheeting and lagging costs.

T&T's common trench has an unusual shape. The main part, which accommodates the storm sewer, is 28 ft wide and varies in depth from 30 to 34 ft. At a height of 18 to 22 ft from the bottom, the trench is widened to make 6-ft-wide benches at either side for the sanitary sewer pipes.

Two different systems retain the walls of the trench. Above

the benches, walls are retained by 2-in. vertical timber sheeting driven to a depth of 14 ft with an air hammer. Sheetings are supported by 8x8-in. timber wales strung to the bracing system that supports the deeper remainder of the trench. This lower portion is retained by permanent 3-in. lagging between Bethlehem 12BP53 soldier beams at 10-ft centers. The soldiers have a 6-ft toehold below the bottom of the final excavation and are cross-braced by 12x12-in. timbers.

Pile Driving Eliminated

T&T's first job was to place these 36 to 40-ft-long soldiers. Because of the proximity of the houses, T&T took a dim view of pile driving. Aware of damage claims that might arise, to say nothing about complaints from the noise, they decided to bore holes for the soldiers and drop them in. For this purpose they assembled a special pre-boring and pile-installing rig around a Lorain 504 truck crane with a 60-ft boom and a 10-ft jib. KAMO drilling equipment is ar-

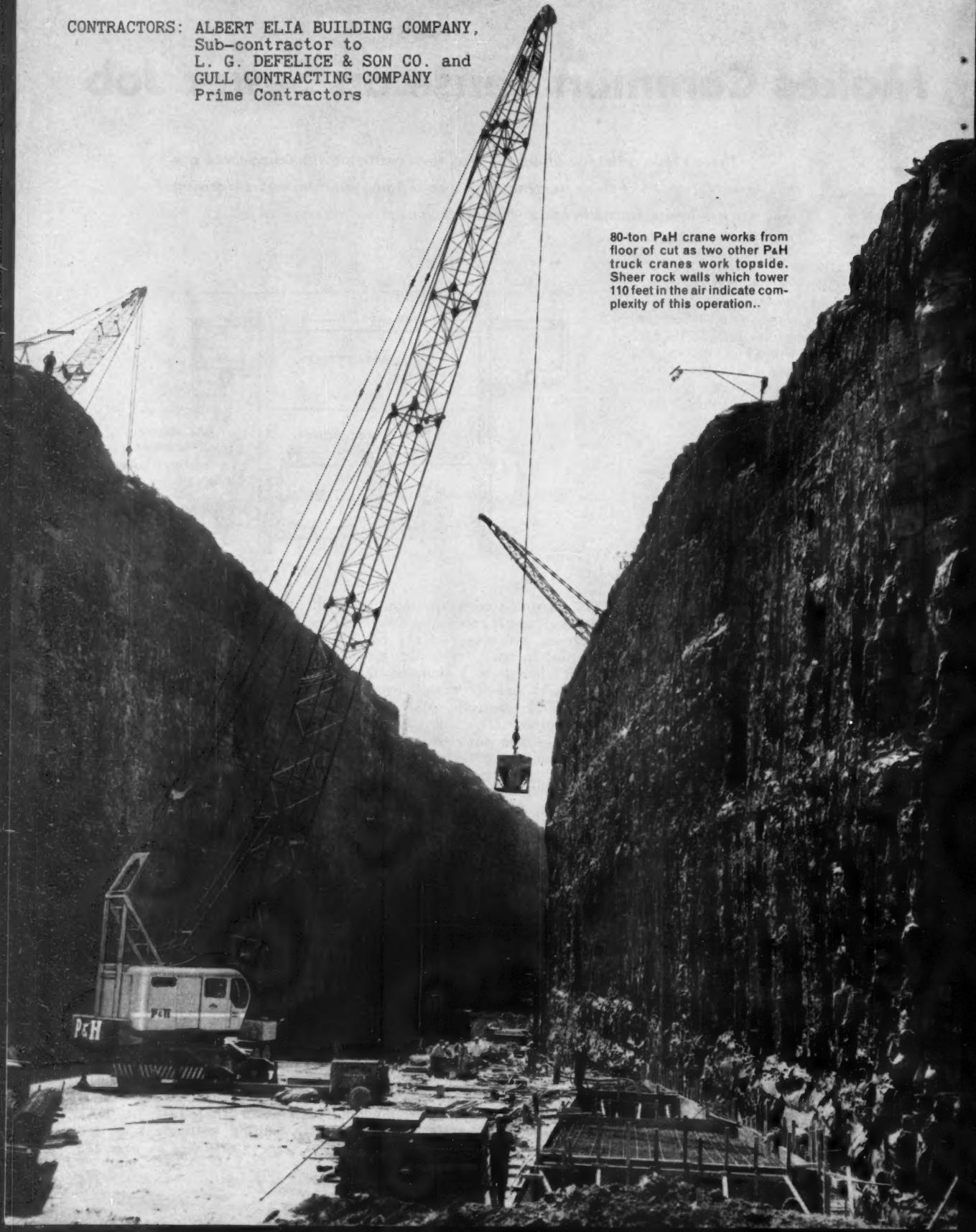
continued on page 122

PROJECT: NIAGARA POWER PROJECT

EQUIPMENT: REBCO STEEL CORPORATION'S 80 and
45-TON P&H TRUCK CRANES working for...

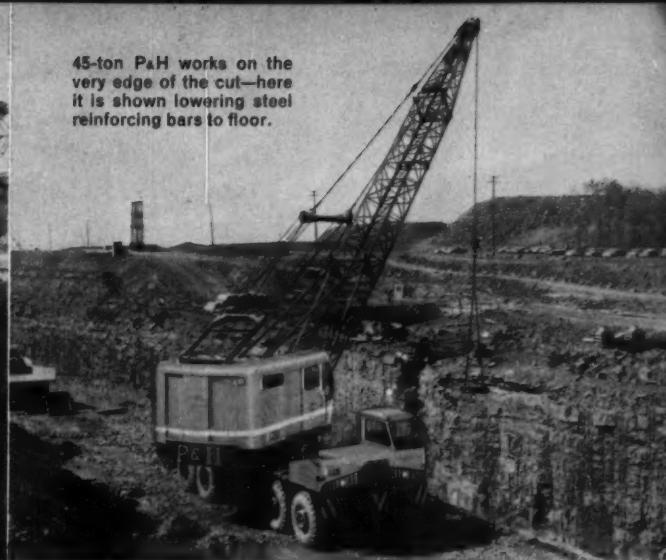
CONTRACTORS: ALBERT ELIA BUILDING COMPANY,
Sub-contractor to
L. G. DEFELICE & SON CO. and
GULL CONTRACTING COMPANY
Prime Contractors

80-ton P&H crane works from
floor of cut as two other P&H
truck cranes work topside.
Sheer rock walls which tower
110 feet in the air indicate com-
plexity of this operation..



Gull Contracting Company's 45-ton in foreground positions drilling platform. 80-ton P&H in background spots concrete bucket alongside redi-mix truck. Both operations are completed out of sight of the operators.

45-ton P&H works on the very edge of the cut—here it is shown lowering steel reinforcing bars to floor.



3 P&H cranes help harness the mighty Niagara

Joe VeRost, Rebco Steel Corporation's Vice President reports—"The unusual conditions here at Niagara forced Albert Elia to operate the 80-ton P&H from the floor of the 110-foot deep cut . . . picking up concrete from a point on top of the cut, out of sight of the operator . . . swinging it out and over and lowering it to the bottom for the pour. In my opinion this could not have been done without Magnetorque swing drive."

80-ton P&H "Feels in the Dark"

Sitting at the bottom of the cut and swinging 160 feet of boom, Rebco's 80-ton P&H truck crane reached up and over the 110 foot wall to pick up loaded 2-yard concrete buckets that were out of sight. It swung them smoothly and easily up and over the lip and lowered them to the floor, where it poured concrete in flat forms. This "out-of-sight" operation was controlled and directed by telephones between the operator and the concrete foreman. Pin-point positioning with 160 feet of boom—no simple task in itself—was made even more critical by the need to work this long boom "within inches" of the wall. It calls for extreme skill and smooth, immediate-action controls.

Mike Comerford, operator, praises Magnetorque—"Without Magnetorque controlled swing it would have been almost impossible to handle this job. With friction clutches, the boom whip would have been too violent—it would not have been possible to swing a few inches at a time. We have been making complete cycles in 2 minutes including pouring which required walking the bucket. To top it off we had to make 180 degree swings."

45-ton P&H works topside—fishes deep

Rebco's 45-ton P&H truck crane, sitting on the very edge of the 110 foot cut, constantly lowered reinforcing steel, equipment and concrete to the floor below. Operator Tom Wagner was also forced to operate "in the dark," receiving directions and instructions by phone.

Tom Wagner says—"Smooth operation and accurate positioning of loads were possible with Magnetorque swing drive and immediate-action hydraulic control system of the P&H. They gave me more immediate control—and that's what we needed on this job."

45-ton P&H truck crane positions drilling rig

A 45-ton P&H, belonging to Gull Contracting Company, operated from the top of the cut where it supports a movable drilling platform some sixty feet down the side of the sheer wall. "Triple-safe" Planetary Boom Hoist assured positive holding of the platform as holes were drilled in the side of the rock wall for steel reinforcing bars. The P&H lowered or raised the platform to new positions as soon as the holes were drilled.

P&H gives unmatched performance

Rushing for completion of this huge project, contractors are putting men and equipment to extreme tests. Operating a two-shift program of ten hours each, the P&H truck cranes are used constantly, twenty hours out of the twenty four . . . six days out of the week. Under extreme endurance tests like this, P&H durability and ruggedness stand out . . . actually deliver more working time on the job.

For complete information on this job, write for Case History 121 or contact your P&H dealer for detailed facts on the complete line of P&H truck cranes.

HARNISCHFEGER

Milwaukee 46, Wisconsin

Circle 121 on Reader Service Card

P&H
CONSTRUCTION &
MINING DIVISION



NEAT SEWER JOB... *continued from page 119*

ranged on the crane so that one operator can control everything.

Just under the boom, the crane mounts a platform that carries a hydraulic pump powered by a 34-hp gasoline engine. The pump drives an 18-in. dia earth auger with eleven 4-ft-long screw flights. The auger rides a 52-ft-long 12-in. WF beam lead that is hung from the boom tip and braced to the edge of the platform. While the hole is being bored, the crane's jib holds the soldier beam in readiness a few feet away. As soon as the hole is bored, the soldier is aligned over it and lowered in. Holes vary in depth from 36 to 40 ft, depending upon the depth of the trench required.

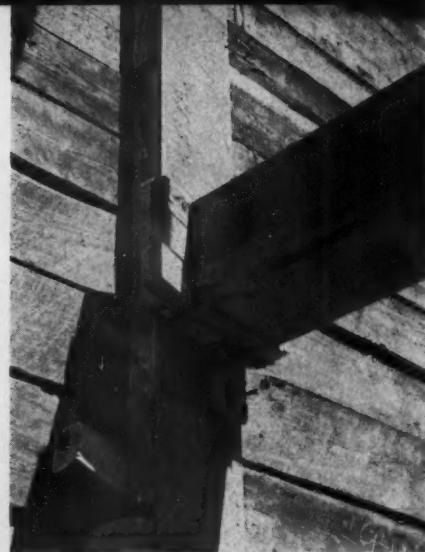
While the soil is composed mainly of sand and gravel, T&T ran into heavy gravel in several places. To bore through this material, the contractor replaced the regular drilling head with a high-spiral HT Trainer Poler-Bore auger. They welded a steel plate to the bottom of the bottom flight and to the top of the Poler-Bore to obtain a continuous flow. They found this combination handled all underground ob-

structions and even cut through pavement.

To spill the earth away from the hole, T&T fabricated from a $\frac{1}{2}$ -in. steel plate a boot sleeve with a conical flange at the top. The sleeve is attached to the base of the lead and fits around the auger. The dirt that falls off the screw flights lands on the flange and piles up in a neat mound around the rim of the hole instead of falling back in.

Two simple devices make it easy to align the soldier beams. When properly positioned, the outside flange of each soldier is 6 ft from a surveyor's mark on the sidewalk. At first, T&T found it difficult to measure the 6 ft accurately with a rule because the mound of dirt formed an obstruction between the mark and soldier. Shortly after pre-boring began, they replaced the rule with a 6-ft-long rebar that slides easily through the mound.

The beam is lowered into the hole through a light guide frame that positions it exactly. The frame is made of $1\frac{1}{2}$ -in. angle irons arranged in a square and bolted to two parallel 2x4-in. timbers that serve as handles.



CROSS BRACE—Angle iron welded to soldier flange supports timber brace that is wedged in place.

DEEP CUT—Three Cat Traxcavators work with $2\frac{1}{2}$ -yd buckets to push dirt from the center of a block toward an intersection. All earthmoving takes place between the two parallel rows of soldiers.

SPOIL REMOVAL—Crane equipped with a 40-ft boom and Owens K clamshell works from a cross street to lift dirt out of the trench. It will load one of twenty 12-yd Mack dump trucks on job.

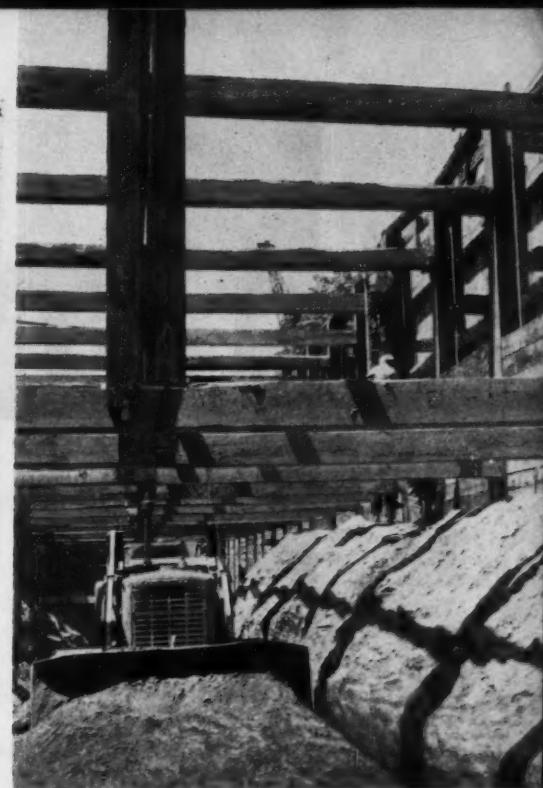
The device fits snugly around the soldier so that two men can move it easily by gripping opposite ends of the 2x4s.

When the beam is in place, the crane operator shakes loose the dirt left on the screw flights. And then workmen refill the hole. In this way, T&T is installing 2,500 soldiers, representing 700 tons of steel.

Trenchwork Procedure

Nothing better illustrates T&T's ability to cope with the complexities of this job than their imaginative approach to excavating the trench. Since it is impossible to maneuver heavy excavating equipment along the narrow space at either side of the trench, all earthmoving is handled between the two parallel rows of soldiers by three Cat 977 Traxcavators with $2\frac{1}{2}$ -yd buckets. These crawler-mounted tractor-shovels stay about 1,000 ft behind the pile-installing rig.

Digging right through the asphalt-paved road, the machines push earth from the middle of a block toward the intersections, where spoil is loaded into trucks. Each block is from 250 to 300 ft



WAY DOWN—Tractor-shovel works under the second level of cross braces as trench nears its final depth. Berm retains walls of the trench until lagging is put in place.

long, and 44 cross streets intersect the project.

T&T has three cranes that work only from the cross streets to load dirt directly into twenty 12-*yd* Mack dump trucks on the job. Two Lorains, one a Model 80 and the other an 880, and a Northwest No. 6 are equipped with 40-ft booms and 2-*yd* Owens K clamshells. T&T chose the K's because they are halfway between a digging and a rehandling bucket, and consequently can do double duty. Sometimes they load dirt fed them by the tractor-shovels; other times they cut out an intersection on their own.

The Borough permits only two consecutive intersections to be closed at one time. To comply with this requirement, two cranes operate at consecutive cross streets, leaving an open cross street to separate the third crane from the other two.

First job for the tractor-shovels is to excavate the trench, including the benches, to a depth of 12 ft. To dig out the bench behind the row of soldier beams, the 977's turn sideways in the trench. There is 9 ft between the soldiers in each row, just enough

width for the 8-ft-wide buckets.

Once the shelf is completed, the Traxcavators dig out the rest of the trench. Maneuvering inside the trench is difficult, but there is sufficient space for turning around.

From the bottom of the shelf on down, 3-in. lagging goes in. To retain the walls prior to placement of the lagging, the tractor-shovels leave a berm about 3 ft wide at each side. Workmen dig away the berm and insert lagging, one board under the other, to the required depth.

To support the soldiers, 12x12-in. timber braces are placed across the width of the trench between opposite soldiers. The first brace is about 3 ft below the top of the trench, and the second brace is about 10 ft below the top brace. Where the trench is at its maximum depth of 34 ft, a third brace is inserted 8 ft below the second brace.

These braces are seated on 4x6x1½-in. angle irons that are welded to the flange of the soldiers. Wood strips are wedged between the ends of the braces and the soldiers. There are no bolted connections. An Austin-

Western hydraulic crane that operates alongside the trench carries and places the braces.

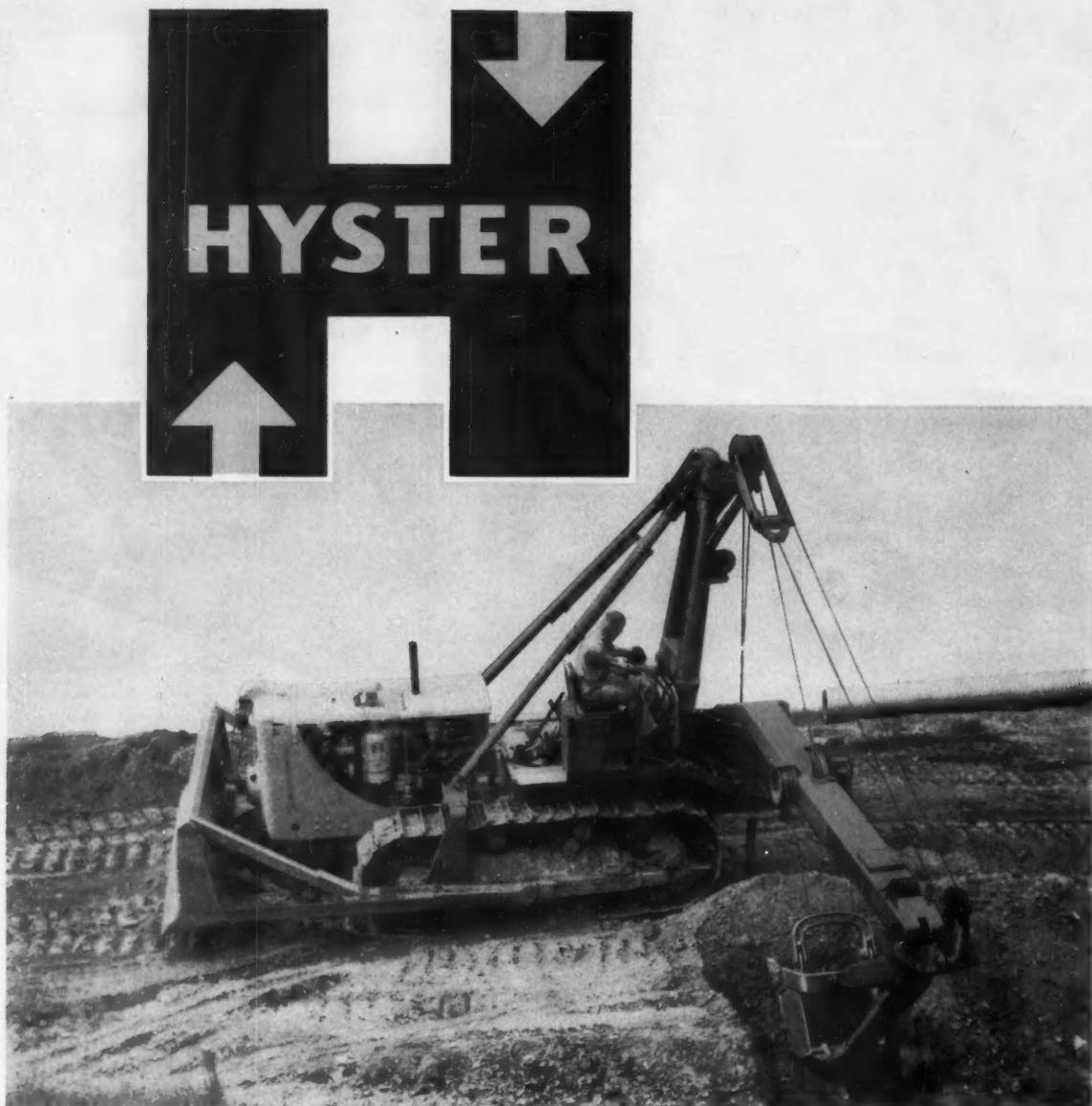
In all, T&T must move 435,000 cu *yd* of earth. Of this amount, 290,000 cu *yd* is used as backfill. As the cut is made at one end of the project, the dirt is hauled off to the other end where it is dumped and backfilled over the completed sewer lines. Each hauling unit on the job carts about 180 cu *yd* in 15 round trips a day.

Building the Storm Sewer

Concreting of the twin-barreled storm sewer follows about 150 ft behind the excavation operation. T&T pours about 375 cu *yd* per day, averages 350 ft of storm sewer per week. (Laying the 8-in.-dia vitrified pipe on the benches is a separate operation.)

T&T poured 200 ft of invert right at the start of concreting, and since then the invert has remained 150 to 200 ft ahead of the roof and walls. Usually, the contractor alternates between pouring about 150 ft of invert one day, and 120 ft of roof and walls the next day.

continued on page 125



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NEAT SEWER JOB... *continued*



INTO THE TRENCH—Concrete crew adjusts elephant trunk for pouring of sewer roof.

DOWN THE CHUTE—Concrete passes from the transit-mix trucks operating at the rim of the trench down a chute and into a hopper.

The invert, cast without forms, is shaped by screed irons hung from 2x12-in. screed boards.

Inverted U forms for the roof and walls have been owned by T&T for years, and they are continually adapting them to different jobs. In this case, two sets of forms are needed, one for each barrel of the sewer.

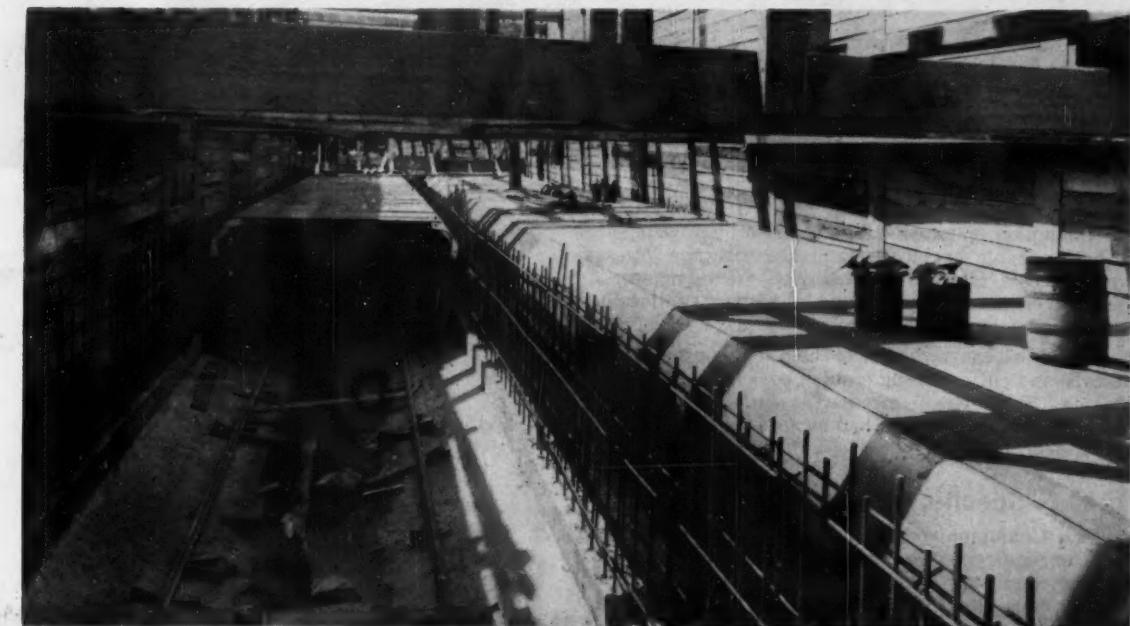
The forms are constructed in six 20-ft sections that are 12½ ft wide and 7½ ft high. Each

form is made of ¼-in. braced steel plate carried by two parallel trusses. The trusses have two 2x6-in. channels back to back for top and bottom chords. Struts between chords, and sway bracing between trusses, are made of varying sizes of angle irons. Turnbuckles attached at 10-ft centers to the struts and to the ribs of the sides of the inverted U swing them out for pouring and retract them for stripping.

The entire form is mounted on a carriage that rides on tracks placed along the invert. A winch line from one of the cranes at a cross street advances the whole assembly. The forms can be raised or lowered with jacks secured to the bottom chord of the trusses. The rams of these jacks thrust against the carriage.

Concrete is delivered to the job in transit-mix trucks that operate

continued on page 128



STORM SEWER FORMS—Inverted U forms for the roof and wall of the storm sewer rest on carriages that ride on tracks placed along

the invert. After each pour, the forms are lowered and the sides retracted, and the whole assembly is advanced with a winch line.



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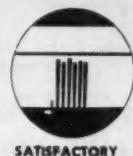
SPARK PLUGS

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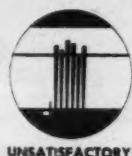
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NEAT SEWER JOB ...

continued from page 125

ate along the rim of the trench. The concrete passes from the truck's chute down another chute, then into a hopper and straight down an elephant trunk. The hopper sits in a frame that straddles two top cross braces.

In most areas there is enough room for the transit-mix trucks between the rim of the trench and the property lines. However, in several places telephone poles reduce the 9-ft clearance by 1 ft



BACKFILLING—Truck dumps dirt over completed storm sewer. As cut is made at one end, dirt is hauled to other end for fill.

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or more. To provide extra space here, T&T bridges the area over the sanitary sewer bench. For this, an 8½x22-ft steel plate 1½ in. thick is placed to span between the trench rim and the tops of the soldiers. By riding over the plate, the trucks can skirt the telephone poles.

The storm sewer requires 68,000 cu yd of concrete and 3,650 tons of rebars.

Backfilling Chores

Once the sewers are completed, the trench is refilled. A Michigan 175A heaps the dirt back into the trench until it is filled to the level of the bench. Then a small Lorain 424 truck crane yanks out the top cross brace, and the soldiers are cut off. The vertical sheeting is removed and the remainder of the trench is filled. The remaining cross braces, lagging, and the rest of the soldiers stay permanently in place.

T&T began working at the job site on Feb. 28. Their contract calls for completion of the job in 320 calendar days. Their present rate of progress indicates that the job will be completed on time.

The storm sewer is to relieve drainage conditions at a housing development project (known locally as the Glen Oaks flood bowl) about 2½-mi away. The line connects with another sewer that passes under Idlewild Airport and empties into Jamaica Bay.

For T&T, Vincent Saggese is project engineer and Angelo Tomasetti is construction superintendent. Martin Nelson is chief of engineers and Jack Donoghue is resident engineer for the Borough of Queens.

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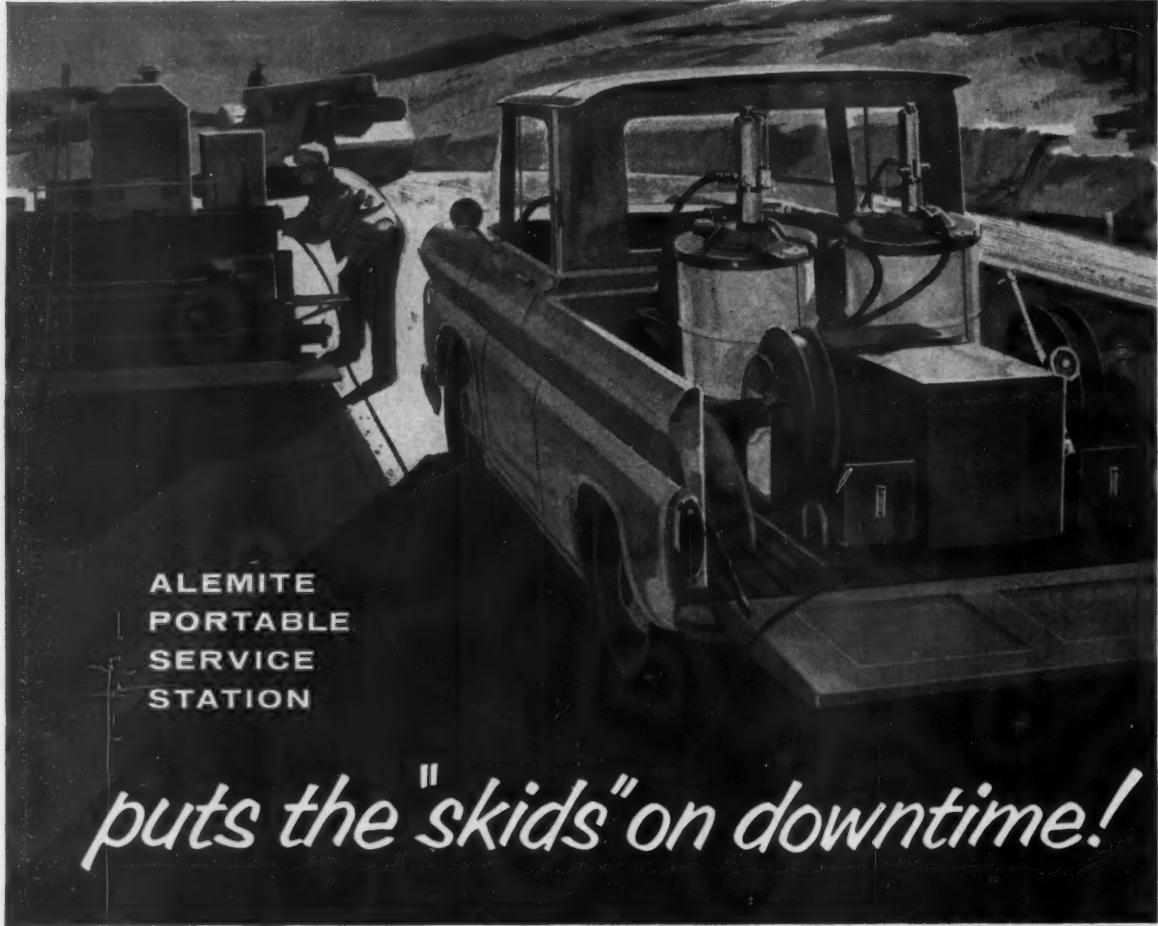
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CURVES AND SETBACKS—Series of S curves on the exterior wall of the first two stories, plus setbacks for the rest of the building, create many difficulties for the contractor.

Building's Irregular Shape Tests Contractor's Ingenuity

A NUMBER of unusual construction techniques have been adopted by the contractor building the \$46-million headquarters for the United States Central Intelligence Agency in Langley, Va., just outside Washington.

A joint venture of Charles H. Tompkins Co. of Washington and J. A. Jones Construction Co. of Charlotte, N. C., holds a \$33-million contract to construct the reinforced concrete superstructure, which has a highly irregular shape. To cope with some of these irregularities, the contractor has to:

- Prebuild special timber falsework bents to support spandrel beam soffits, and preassemble plywood forms that meet wall curvature requirements.
- Fabricate special steel forms for the splayed drop heads over the columns.
- Dry-batch concrete on the site and deliver it to work areas by a combination of transportation techniques.
- Create control joints in walls and floor slabs with a plastic joint-former used primarily in highway and runway paving jobs.

The building, supported by reinforced concrete columns that are cast in place, rises seven stories and provides 1-million sq ft of floor space. It is arranged on a 450x900-ft area to create three enclosed landscaped courts. Two courts are 80x140 ft; the other is 140x260 ft.

Building Blocks

The first two stories encircle the courts. Their exterior walls facing the approaches to the building are a series of S curves and rounded corners. The remaining five stories consist of five interconnected structural blocks that are set back a minimum of 100 ft at the sides and 35 ft in the front. The main block at the front of the building measures 91x665 ft. Two 91x271-ft blocks run parallel to the main block and are connected to it by two 91x151-ft blocks.

All floor slabs in the building are of waffle design cast on Unit pans supplied by the Adjustable Forms Co. of Chicago. The slab has a minimum thickness of $2\frac{1}{2}$ in. and a maximum of $14\frac{1}{4}$ in. The pans are placed over 4x8-ft sheets of plywood decking, $\frac{3}{4}$ in.



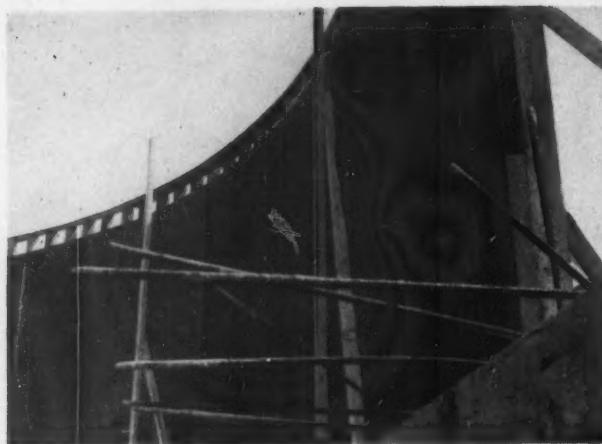
TIMBER BENTS—Placed only at edge of slab, prebuilt bents will support spandrels.

thick, which is supported by falsework.

The falsework consists of Truscon bar joists at 2-ft centers that rest on 4x4-in. wood stringers at 10-ft centers. The stringers are seated in some cases on Acrow pipe shores and in other cases on 4x4-in. wood posts that are ad-

BUILDING'S IRREGULAR SHAPE . . .

continued



CURVED WALL FORMS—Panel forms of $\frac{3}{8}$ -in. plywood sheeting fit at precise locations. Each panel measures 5x13-ft.



JOINT FORMER—Vinyl-plastic strip, nailed to edge of a form, protrudes far enough to create joint 3-in. deep.

Prebuilt Forms Shape Columns And Drop Heads

justed to proper height with Ellis clamps.

Timber Bents

Another falsework system, a series of prefabricated timber bents, provides support for the spandrel beam forms.

Each bent has two 4x4-in. posts, 3 ft apart, connected by 1x6-in.-diagonal bracing. The posts, cut to a standard height of 12 ft, are adjusted to varying floor heights by placing wood shims under them. The bents, spaced 2 ft apart, are connected by 6x6-in. stringers that carry 4x4-in. wood joists at 16-in. centers.

An estimated 170,000 sq ft of formwork was built for the job, most of it to be reused. The contractor bought rough lumber from local mills, pre-cut to required lengths wherever possible. But because of irregularities, there still was a considerable amount of waste.

Panel forms for the curved walls of the first two stories were built in a job carpenter shop to fit precise locations. Each 5x13-ft panel form has a 2x6-in. top and bottom plate trimmed to exact radius on a templet. The



DROP HEAD FORMS—Prefabricated splayed forms consist of four sections of heavy-gage steel bolted together with sides at 45 deg angle.

plates are connected by five 2x4-in. vertical studs and braced by a 2x4-in. waler. The curvature is gradual enough so that only a minimum amount of forcing is necessary to nail $\frac{5}{8}$ -in.-thick plywood to this frame. These panels are held in place with Superior A. C. form ties.

For drop heads, the contractor fabricated forms made up of four sections of heavy-gage steel that can be bolted together into a hopper-like unit with sides at a 45 deg angle. At the top, the form is 4 ft 6 in. sq. The opening at the bottom can be adjusted from 18 to 30 in. sq to fit varying column sizes by adding or removing wood strips. The sections are fastened together with wing nuts on bolts that can be released for easy stripping.

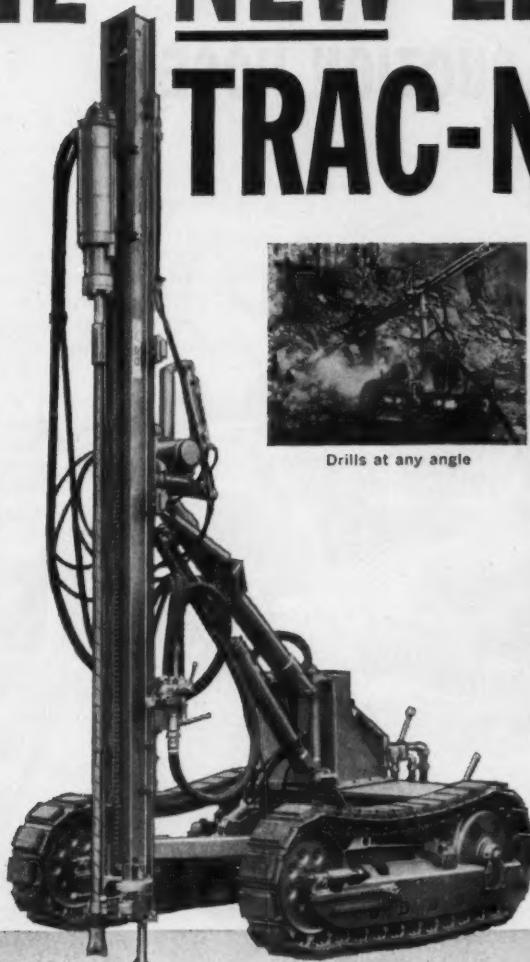
Concreting

Excluding the foundations, the structure requires more than 100,000 cu yd of concrete. All concrete is batched dry on the job site in a plant with 140-ton bins and hauled off in transit-mix trucks to the buildings about 400 ft away. Super Concrete Co. of Washington, D.C., the supplier, prefers this system to setting up a complete mixing plant.

The method by which concrete is moved to the pouring area depends upon the accessibility of the building block. For the ground floor slab, concrete is delivered directly to the pouring area in the trucks. For the remaining floors, cranes are impractical because of the large setbacks. Four hoist towers are on the job, all of

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BUILDING'S IRREGULAR SHAPE . . . *continued*

them made for Tompkins about 15 yr ago by the General Supply and Equipment Co. of Baltimore.

Delivery to the main building block is not affected too much by the 35 ft setback. The gap between the building and the hoist tower is bridged by runways supported by scaffolding. But the delivery of concrete to the other building blocks with minimum 100-ft setbacks requires a relay system.

The contractors decided against running the trucks over the ground floor slab to the inner blocks of the building. They do not consider the slabs strong enough to bear the strain. And they wanted to proceed with window installations on the ground floor.

For these inner blocks, transit-mix trucks deliver concrete in 6-yd batches to a hopper mounted at the edge of the ground floor slab of the perimeter building. Whiteman and Prime Mover 1 yd motorized buggies pick up the loads from the hopper and carry them about 200 ft to a hoist tower in the center of the building being poured. Once the concrete is lifted to the proper floor, more powered buggies carry it on runways to the work area. A total of seven buggies are in constant use, four on ground level and three on the floor being poured.

Despite the number of handlings involved, they place more than 70 cu yd of concrete per hr. The batch plant can produce up to 7 yd of concrete every 2 min if required.

Joint-Former

Tompkins-Jones makes joints in the wall and floor slabs with Form-con, a vinyl-plastic strip that is inserted between plywood panel forms before the concrete is poured. While the strips have been used recently for paving, this may be the first time that they have been adapted to structural concrete work.

Manufactured by American Sisalkraft Corp., the strip consists



RELAY SYSTEM — Concrete goes down chute, through window, into ground floor hopper. Then buggies take it to hoist tower.

of two parts. The outside is a V-shaped envelope that creates a joint 3 in. deep. A spreader strip fits inside the envelope to maintain the proper width of the joint and to facilitate stripping.

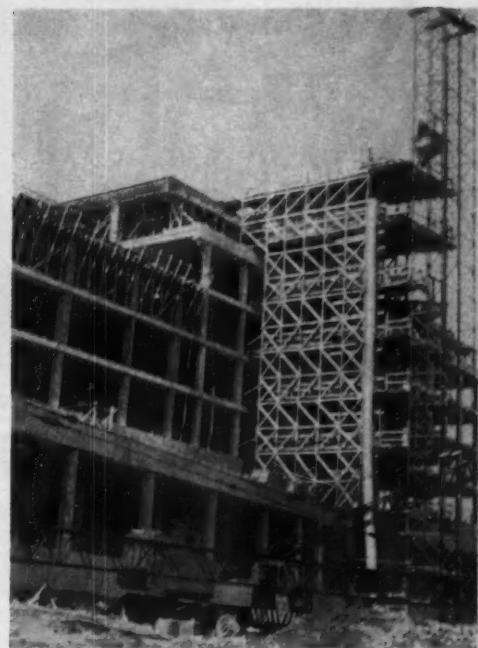
For insertion, the joint-former is nailed to the edge of a plywood form. Then the adjoining form is butted against the strip. The strip protrudes far enough inside the form to create a joint in the concrete.

The plastic joint-former is removed when the forms are stripped. First, the spreader is pulled out. Then the envelope is taken off with the forms.

Tompkins-Jones finds this is a neat, quick system for forming joints. No additional sawing or cleaning is required. And the strips can be reused several times.

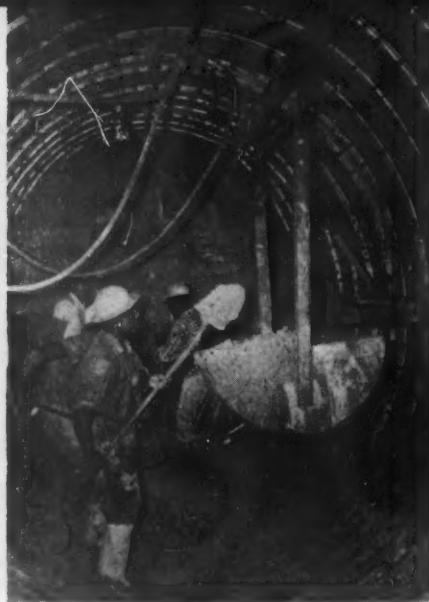
The exterior of the building, except the second and seventh floor, will have precast concrete window panels. These 5x13½-ft panels, weighing up to 1½ tons, are being made of white cement and exposed quartz by Economy Cast Stone Co. of Richmond, Va. Exterior walls for the other two floors will be glass with columns set back.

Tompkins-Jones did not handle foundation work. This came under an earlier \$2.3-million contract to Roscoe-Ajax Corp. of Washington. The foundations are 30-in. concrete caissons sunk to bedrock at depths varying from a few feet to more than 60 ft. The foundation also includes bearing walls for the basement and an underground garage.



FRONT SETBACK — To overcome 35-ft setback at the front of building, the contractor bridges gap between structure and hoist tower with runways on scaffolding.

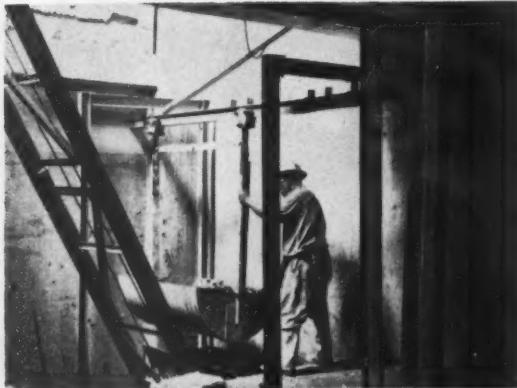
J. S. Davidson, Jr., vice president for Tompkins, is construction manager for the joint venture. I. A. Dill is project manager and Bruce Hutsler is concrete superintendent. Construction comes under the direction of the Public Buildings Service of the General Services Administration, for whom Ralph Bauer is project engineer. Harrison & Abramovitz of New York City are the architects.



Crew shovels muck into bucket



Bucket rides monorail to the shaft



Muck is dumped into elevator bucket



On street, bucket empties into truck

Monorail System Handles Tunnel Muck

Hand-mining at the face, plus a simple monorail and elevator system for muck handling, proved to be the most efficient way to drive an 84-ft-long, elliptical shaped tunnel under a busy intersection in Houston.

A SIMPLE, but ingeniously designed, monorail and elevator system solved a muck handling problem for Armco Drainage & Metal Products Inc. on an 84-ft-long tunnel they mined in Houston, Tex.

The tunnel, 26 ft below ground, is an elliptical-shaped pedestrian underpass that crosses diagonally under the intersection of Fannin St. and Lamar Ave. The bore connects the 29-story First City National Bank Building with its multi-story parking garage on the opposite corner. The completed passage is 7 ft wide and 8 ft high, but driven size was 9 x 11 ft.

Because the intersection is a busy one, and underlain by a maze of utility cables and sewers, Armco could not build the passage in an open cut. They decided to tunnel from a shaft at one end and hand-mine the face. As they progressed, crews lined the tunnel with Armco steel liner plate. Later, the walls will be finished in tile.

Manhandling Muck

To get the muck from the face to the shaft and up to the street, Armco set up a conveyor system. According to Carl Boelson, manager of Armco's Houston Con-

first developed for another job in Iowa. Armco got the idea from the litter carriers on dairy farms.

The conveyor's monorail is a 4-in., 7.7-lb I-beam bolted to the flanges of the liner plate at the top of the tunnel. In the shaft section, the rail is supported on several I-beam bents, each consisting of a horizontal beam and two vertical posts.

A 1-yd muck bucket was suspended from rollers that rode the flanges of the rail. When the bucket was full, it was pushed by hand to the shaft and dumped into a bucket on a sloping elevator.

The bucket on the elevator was raised by an American two-drum hoist at the bottom of the shaft. At the top, the rails of the elevator turned out and downward so that when the bucket reached that point, it turned upside down and emptied its contents into a dump truck on the street for disposal.

Tunneling Operations

Crews excavated at the face with a Chicago Pneumatic Model 31 clay digger and a Thor Model 412 clay spade. Both were powered by a LeRoi 125-cfm compressor.

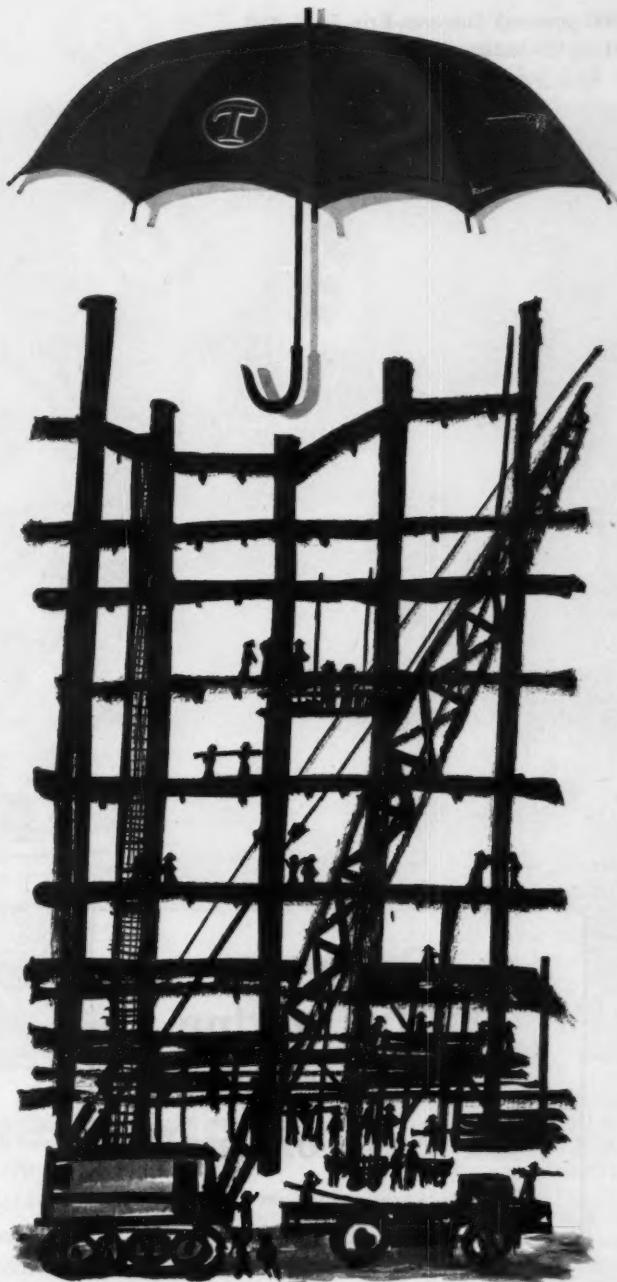
The liner plate is Armco 8-gage galvanized steel that comes to the job in 18x53-in. sections. Eight sections form one ring. Joints are lapped and fastened with $\frac{5}{8}$ -in. bolts.

To make the tunnel watertight, the void outside the liner plate was grouted. The mix was four parts sand to one part cement with a small amount of bentonite drilling mud added for lubrication. A grout pump that developed 60 psi pressure forced the mix through 2-in. holes in the liner plate at a rate of about 3 cu yd per hr.

Tunnel crews worked a 12-hr shift starting at 4:30 pm. The schedule was designed to keep interference with street traffic to a minimum. The job took about three months.

Project Personnel

Armco's Houston Division Office is directed by W. W. Mains, vice president and general manager. Carl Boelson is manager of construction. General contractor on the job was W. S. Bellows Construction Co., Houston.



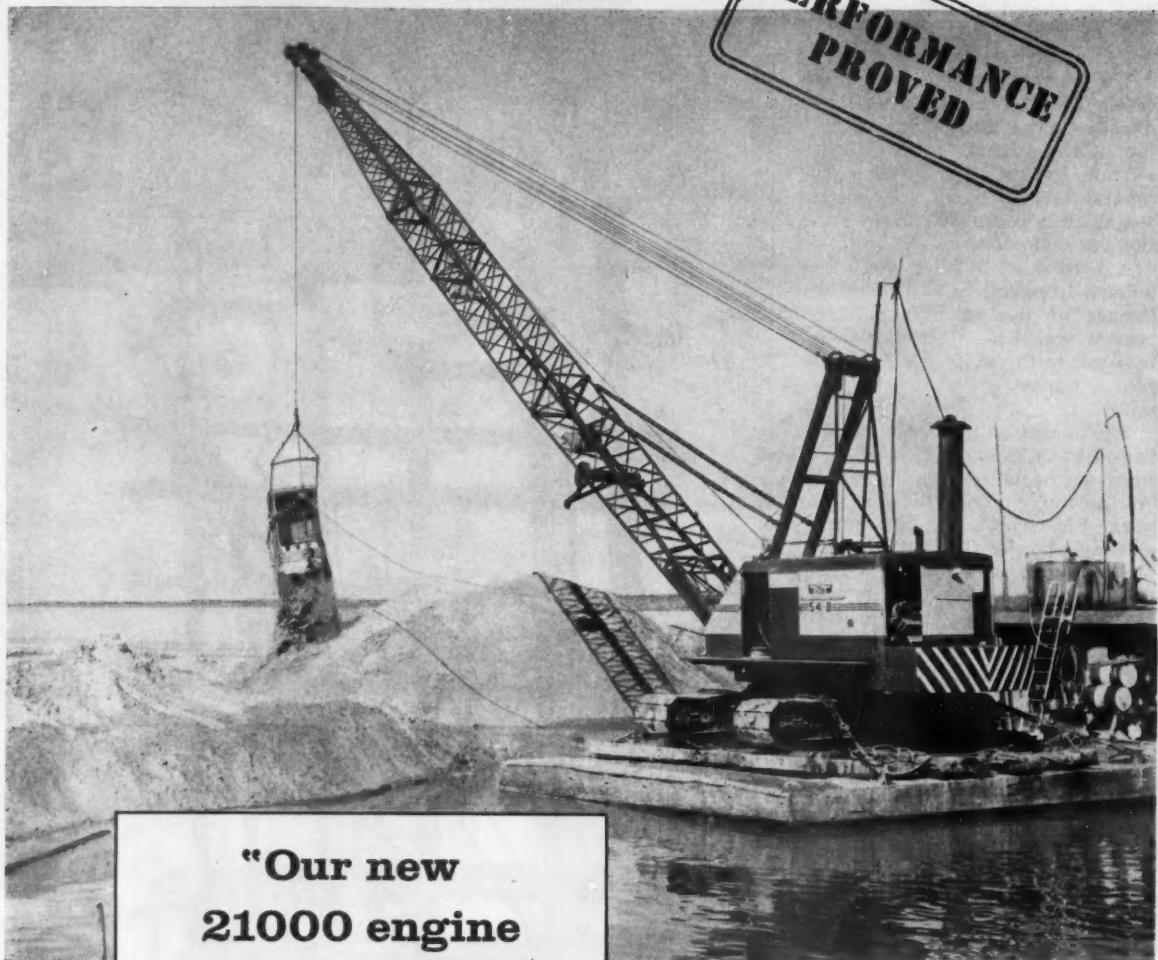
Keep the job rolling with The Travelers. There are 4200 Travelers claims people at 277 locations across the country to make sure your claims are settled *pronto!*

Builders' Risk Insurance protects your progressing investment against fire and other hazards. A Contractors' Equipment Floater covers your equipment in transit or at any location in the event of an accident.

For this important protection and service, plus Workmen's Comp and Public Liability, Bonds, or any kind of business insurance you may need see your Travelers man.

THE TRAVELERS
Insurance Companies HARTFORD 15, CONN.

This 21000-powered Bucyrus-Erie 54-B and personnel on the barge with it must work in isolated areas for long periods at a time.



**"Our new
21000 engine
is saving 30%
and more on fuel!"**

— says spokesman for Sam Carline, Inc.

"We are pleasantly surprised to see how well the 21000 does the job of the larger engine we took out of a 54-B," said Wallace Carline, general manager of Sam Carline, Inc., Berwick, Louisiana. "Then when we found our fuel saving was so great, we were even more sold on it. We have now ordered a second one for another of our Bucyrus 54-B's."

The dragline is mounted on a barge, along with living quarters for the personnel, and operates in back swamps and bayous of Louisiana. Since it must work for long periods in the remotest parts of this country, dependability and a minimum of maintenance are essential. The 21000 has fulfilled every expectation—requiring no attention other than routine maintenance.

If you want performance, fuel economy and dependability like this, let your dealer tell you more about the amazing 21000 and the companion 16000 diesels. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS
POWER FOR A GROWING WORLD

BC-31





AT THE DIGGING END—A single 4½-yd Bucyrus-Erie shovel excavates all of the rock and dirt being moved for this project. Here the shovel is loading a Euclid dump truck on a bench high above the Ohio River.

Small Fleet Turns Steep Cliff Into Four-Lane Road

A FOUR-LANE HIGHWAY, part of Ohio Route 7, slowly is taking shape along the Ohio River near Steubenville. Work progresses at a slow pace because the road is being carved out of a nearly vertical cliff high above the city, the river, and a railroad.

One of the contractors here is Codell Construction Co., Inc., of Winchester, Ky. Their job covers only a 4,300-ft stretch of the four-lane road, but they will excavate and move about 640,000 cu yd of dirt and rock to complete the job. Work was started last December, and the contract calls for completion by August 1961, but Codell hopes to be out of there before the end of this year. And

they'll probably make it, thanks to the steady, almost continuous round-the-clock operation.

No Operating Room

The steep hillside the machines work on offers very little room for maneuvering, and it's impossible to operate a large earthmoving fleet. With this in mind, Codell moved in just a dozen pieces of heavy equipment, built a good haul road, and prepared for a long stay.

Practically all the excavated material, except for 17,000 yd, is wasted. And the only place to dump it is a valley on the other side of the mountain on which they are working. Not being able

to go around the mountain, Codell built one main haul road that runs up and over the top of the mountain at about the halfway point in the 4,300-ft stretch. Three Cat D8's worked nearly a month to build the haul road.

Earthmoving Fleet

Approximately 85% of the material to be excavated is rock, the rest is dirt. All of it is being moved by shovel and trucks because the terrain is too rugged to make scraper operation efficient to move the 15% of loose dirt on the job. Digging out the material is a 4½-yd Bucyrus-Erie shovel; hauling it is a fleet of Euclid 63TD dump trucks.

Codell keeps ten to twelve Eucs on the job, but only eight or nine of them are in operation at any one time, depending on how many trucks it takes to keep the shovel busy. The extra trucks are spares for use in case of breakdowns. Also, they help put the maintenance program on a continuous basis because two or three trucks can be serviced during the day without taking any units out of production.

Parking area for the extra equipment and location of the



ON THE HAUL ROAD—Loaded trucks stay on solid footing close to the cliff-side while empty trucks pass them on the left.

maintenance facilities is a leveled portion of the fill in the waste area. There's only a minimum of maintenance equipment on the job because of the small fleet of machines.

Excavation was started at about the middle of the job and is proceeding in both directions. Haul distance generally is fairly short, but the grade averages between 12 and 14% and puts quite a strain on the trucks. The grade does not change as the excavation progresses. Codell is excavating in benches along the side of the hill, and when the shovel moves from bench to bench the trucks merely enter the haul road at a different level.

The haul road itself is quite narrow and sometimes poses a slight traffic problem for the dump trucks. Along most of the road there's hardly enough room for trucks to pass each other, and several turnouts are provided for this purpose. Safety measures have to be taken at all times to prevent rocks from rolling down the hill where the existing two-lane Route 7 and a railroad run parallel to each other along the Ohio River.

Rules of the Road

On the haul road and on the south end of the project the trucks follow the British rules of the road by driving on the left. This is done to keep the heavy, loaded trucks on good footing close to the solid hillside. Empty trucks drive along the riverside edge of the road.

When the shovel moves to the other end of the project on the north side of the haul road, the trucks drive on the right along the bench and on the left when they get to the haul road.

Keeping the haul road in good shape is a pair of Caterpillar graders. These also work in the waste area keeping the surface of the fill suitable for the dump trucks to drive on.

The Cat dozers work in two places. One of the D8's stays near the shovel keeping loose dirt and rock within the shovel's reach and cleaning up behind the shovel to provide a turnaround area for the Eucs. Another dozer works on the fill, spreading the material after the trucks dump it and pushing excess dirt over the edge of the fill to keep the surface level

so equipment can move about easily.

Practically all of the rock has to be drilled and blasted. Codell's own crews handle this operation with a Reich 750 rotary type vertical drill mounted on an International TD-24 tractor. Drilling crews work only during a 10-hr daylight shift. Occasionally, when the shovel is about to catch up to the drillers, a 12-hr shift is necessary.

They're drilling $5\frac{3}{4}$ -in.-dia holes and using ammonium nitrate with a 40% gelatin primer and four different delays. It takes an average of about $\frac{3}{4}$ lb of explosive per cu yd of rock.

Unlike the drilling crews, the shovel and trucks work two 10-hr shifts, five days a week, weather permitting. In the winter they worked two 8-hr shifts.

In good weather, Codell hauls as much as 4,500 yd per day. This is the estimated yardage based on 10-yd loads. But Codell's job superintendent, Ray Stanfield, feels that actually they do better than the 4,500-yd figure. And it looks like they'll be able to pull out ahead of the scheduled completion date.

THE NEW GIANT FOR INDUSTRY...
THAT STANDS WAIST HIGH TO A GROWING BOY!



NEW BLOOD BROTHERS "150 WB" UNIVERSAL JOINT

HAS AN ULTIMATE YIELD OF
600,000 INCH POUNDS
OF TORQUE...
WITH A SWING DIAMETER
OF ONLY 13½ INCHES!

The boy in the picture is holding one of Blood Brothers' smaller universal joints to show the relative size of its giant new "150WB." One of the largest universal joints ever built commercially, it will adequately handle 162,000 inch pounds of torque using a safety factor of 10 to 1... in a swing diameter of only 13½ inches! The "150WB" was designed for compact installation in such operations as rolling mills, gantry cranes and ship drive shaft applications. In spite of its size, this giant unit may be

assembled or disassembled by removing 4 bolts.

The "150WB" proves again that you can get the exact universal joint you need from one source... anything you need from a simple assembly built to handle 350 inch pounds of torque, to the "giant" in the industry. Whatever your requirements, either a standard item, or an unusual design for a special application, Rockwell-Standard engineers can meet your specifications... at a considerable saving in cost. Write or call for complete details today!

Another Product of...

ROCKWELL-STANDARD
CORPORATION



Universal Joint Division, Allegan, Michigan

Foundation Crews

ERCTION of 22 additional stories to cap an existing 4-floor garage—situated just two blocks from Lake Michigan — recently gave rise to a distinctive foundation perplexity.

Although the 37-year-old Tower Garage, located near Chicago's famed Water Tower, was built to take heavy loads, it was not originally designed to take additional floors. The project sponsors, contemplating a 26-story \$6 million apartment house on the site, elected to leave the garage intact and tack on 22 more stories. This decision, compared with the more conventional method of razing and rebuilding, proved economically successful to the tune of saving \$750,000.

Headroom Creates Problem

But, it also meant that 36 caissons to support the superimposed structure had to be put down 96 ft, working from the garage's first floor, where maximum headroom was 13 ft. The limited head space ruled out the big auger-type Calweld drilling rigs that Case Construcion Co., the foundation contractor, normally uses on caisson jobs. Instead, they had

to hand-mine the shafts. And this was complicated by running sand and a high water table.

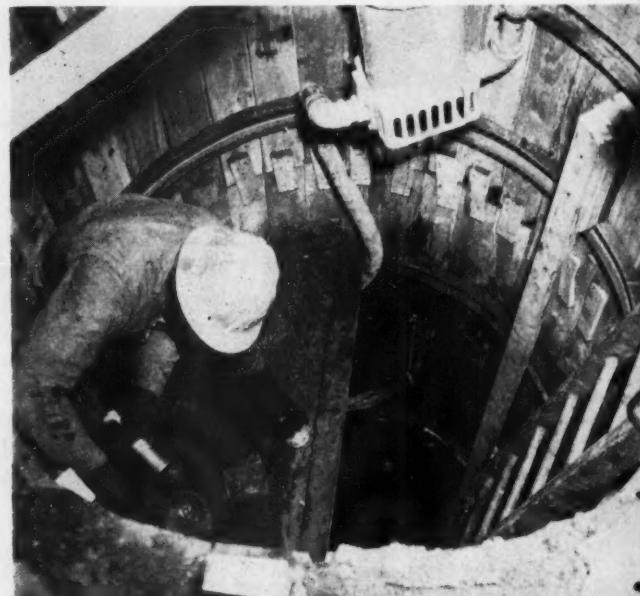
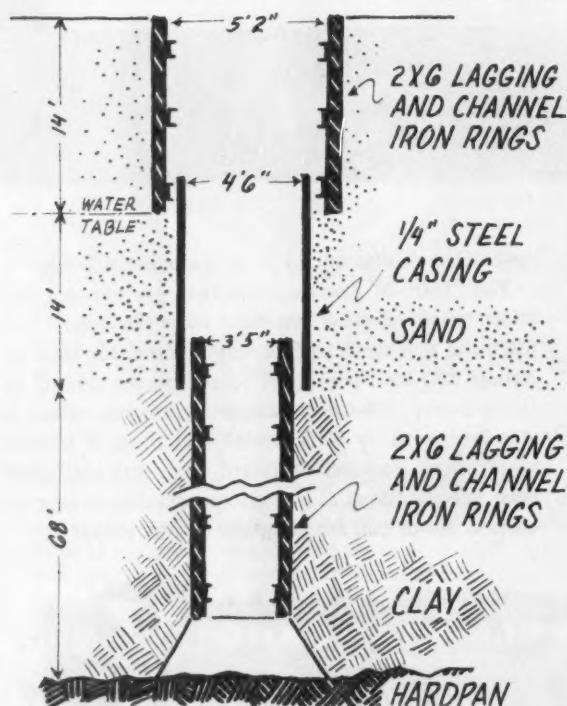
To do the job, the Roselle, Ill., contractor had to:

- Install braced lagging in $5\frac{1}{2}$ -ft-dia holes in sand until water was encountered (at approximately 14 ft) and remove material within the lagging.
- Drive $4\frac{1}{2}$ -ft-dia steel casing through the sand and water until sealed in clay (about 16 ft more) and muck it out.
- Dig the remainder of the caisson as a $3\frac{3}{4}$ -ft-dia shaft through clay to hardpan (some 66 additional feet), installing braced lagging as excavation progressed.
- Excavate the bell at hardpan level.
- Set required reinforcing and pour concrete.

Case undertook digging the caissons to the hardpan level in sand-silt soil overlaying the familiar Chicago blue clay. For this, practically the entire first floor of the garage was turned over to the contractor. But the three upper floors were continuously in use for the parking of cars, with only minor inconven-

The addition of 22 stories to the present structure (above) requires sinking 36 caissons through sand, water, and clay.

Limited headroom requires excavation by hand and novel methods of driving casings.



LAGGING—Lagging 10-ft long is placed to fit the $5\frac{1}{2}$ -ft-dia hole. Five feet more are scabbed on and the section driven down.

Fight Water, Lack Of Space

ience caused the garage owners.

Most of the spread footings of the existing garage foundation measured 9x9 ft and were on 14-ft centers, so caisson placement required great accuracy. Circles 5½ ft in dia were laid out, and Ingersoll-Rand and Thor paving breakers cut through the 6-in. concrete floor slab.

As each hole was opened, workmen hand-excavated the soil to a depth of 6 or 7 ft before placing a 10-ft set of 2x6-in. tongue and groove lagging braced with channel iron rings to fit the hole. Several semi-circular platforms resting on caisson rings were installed in the upper portion of each caisson to serve as intermediate shoveling decks. As hand excavation progressed, a 5-ft set of 2-in. lagging was scabbed onto the top of the lower set. The entire 15-ft section was driven downward with Thor sheeting hammers so that the lagging was flush with the top of the concrete floor.

Water was encountered at 14 ft, and excavation temporarily halted. The water could not be pumped out because the garage footings which ranged up to 11½-

ft square, rested on the sandy soil 2 to 3 ft above the water table. The danger of this material collapsing due to undermining while pumping was ever-present. So Case decided to sink a casing.

An ingenious device for handling the casing was developed by the contractor. Two 4-ft steel bars were attached to the sides of the bucket of a Case loader. Cables fastened from these bar supports to shackles connected through holes burned near the end of the casing allowed the Terratrac operator to assist workmen lower the 11-ft-long, 4½-ft dia section down the caisson.

Three Sinking Attempts

Case attempted three different methods of sinking the casings through the 14 ft of sand and water into the clay, 28 ft below the garage floor. Initially, the crew tried jacking against the heavy reinforced concrete beams on the underside of the second floor. Structural engineers determined that a jacking load of 30 tons would be the maximum allowable reaction on the beams. This was insufficient to force the steel casings downward. Heavy

timbers propped between the second and third floors might have been used to increase the allowable jacking load, but since this would have ended car storage, the method was abandoned.

Next, the contractor attempted to loosen material below the casing by mixing bentonite with the sand and water in the ground. For this, he used a modified drilling rig, since headspace ruled out conventional machines. The turntable of a Mobile drill was mounted on four casters, for ease of movement on and off the caisson holes. Although the drill operates with limited headroom, it was still necessary to cut a 1x8-ft rectangular hole in the second floor slab to allow room for the tower assembly housing the spindle feed cylinder.

A 16-in. auger bit was lowered into the hole by the drill operator and bentonite was churned up with the sand and water in and below the casing to form a slurry.

The second step was simply a change to a 24-in. or 30-in. auger to continue the mixing process until approximately 10 sacks of bentonite had been added. Then,



LOWERING CASING—Cables attached to two steel bars projecting from Terratrac bucket allow operator to assist lowering 11-ft section.



EXPERIMENTAL METHOD—Mobile drill churns mixture in hole to facilitate driving of steel casing.



SUCCESSFUL METHOD—Pile hammers drive on WF beam held by positioning lugs. Hammer impact on $\frac{1}{4}$ -in. casing necessitated welding plates on inside of section.

FOUNDATION CREWS . . . *continued*

portable pile hammers drove the casings down with comparative ease. But, this method, too, was discontinued because second floor cutting interfered with car storage, further expense was necessary to patch the floors, and cramped quarters slowed the operation.

Two pile hammers (Vulcan DGH 100A and McKiernan-Terry No. 3) used simultaneously proved to be the final solution. Nevertheless, the impact of the

hammers on the edges of the $\frac{1}{4}$ -in. casing was so great that $\frac{1}{2}$ -in. steel plates had to be welded on the inside of the casing. Positioning lugs on the plates held in place a 10-in. WF beam, spanning across the casing, on which the hammers drove. As the first 11-ft section was driven deep enough to allow placement of the second, the specially adapted Terratrac lowered the next section. The two casings were joined with a continuous butt weld and then driven down until they penetrated 2 ft into the underlying clay strata, forming a watertight seal.

The succeeding operation involved removal of the sand and water down to the clay. With limited headspace, the contractor placed a 10½-ft tripod derrick (anchored to a 2-in. timber deck) over the caisson. An Ingersoll-Rand tucker hoist and bucket were used with the tripod to raise the hand-excavated sand. A 2½-in. Chicago Pneumatic sludge pump sucked out water trapped within the casing. Where clay was reached, each casing was reinforced internally with two 4-in. channel iron rings.

The Chicago Well technique was employed in excavating the remaining distance to the hardpan level, some 66 ft through blue clay. Most shafts were $3\frac{3}{4}$ in. in dia. The Chicago method was developed for use in medium to stiff clays which can hold a face of about 6 ft. After the first lift was hand-excavated with Ingersoll-Rand Air Spades, 2x6-in. tongue and groove lagging 5-1/3 ft long was placed.



MUCKING OUT—Ingersoll-Rand tucker hoist, bucket, and tripod raise material.

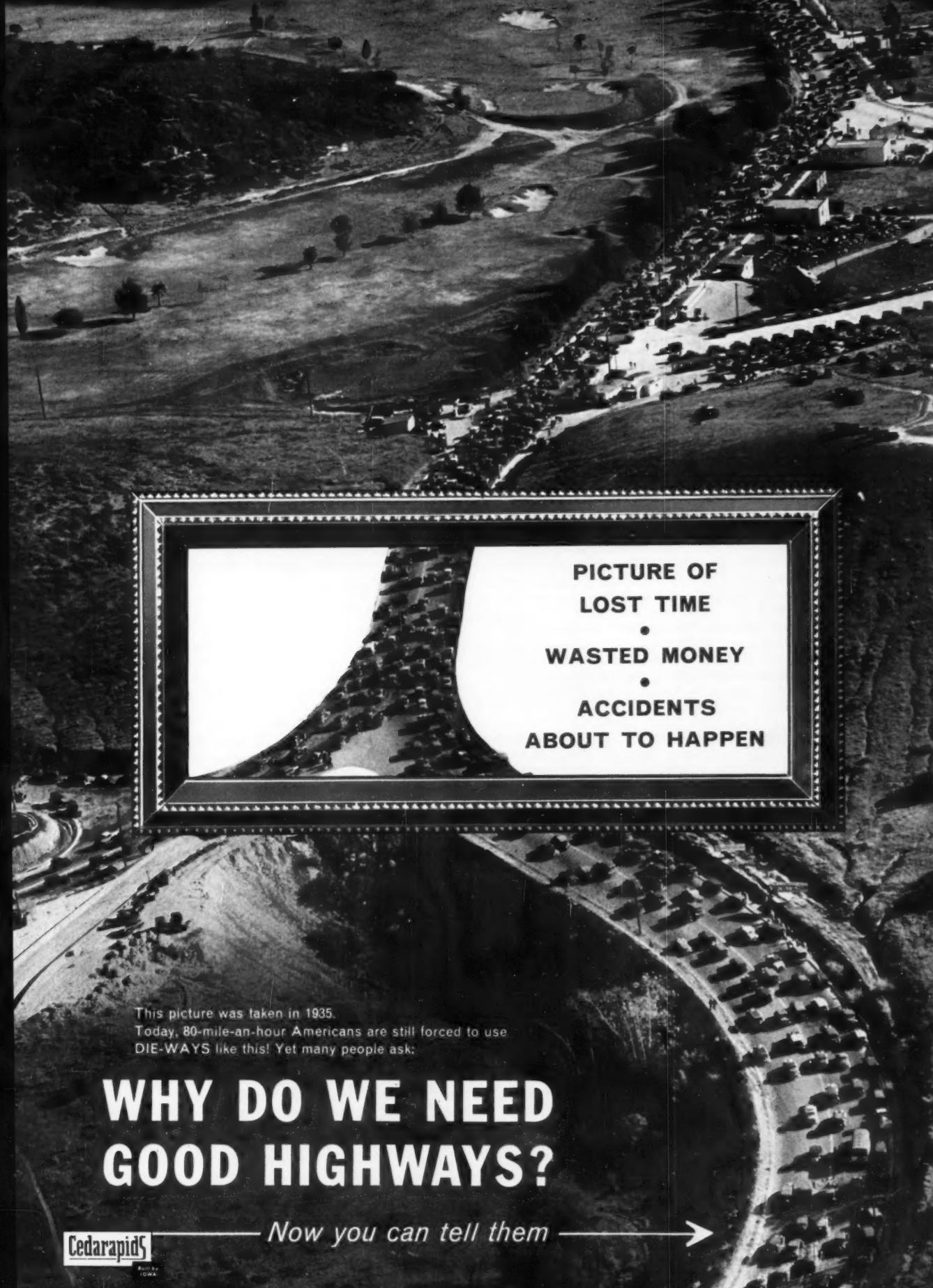
Iron rings located 16 in. from the top and bottom held it in position. Succeeding lifts were similarly excavated and sheeted down to the hardpan bearing stratum, about 96 ft below the garage floor. At the finished depth each caisson was belled out.

As the Chicago Well lagging was started in some of the holes, water leaked through the joints of the timbers. To halt seepage a cement-sand grout seal was poured by bucket into the annular space between the inside of the steel casing and the outside of the upper portion of the first set of lagging. A four-bag mix was used and the comparatively stiff grout was rammed into place. An electrically operated Flygt pump handled water removal.

All of the caissons were excavated in open air, with circulation controlled by Mine Safety Appliances' Lamb air movers. Two Ingersoll-Rand Gyro-Flo rotary air compressors (315 and 365 cfm) provided air for the hoists, spades, pile hammers, air movers, sludge pumps, and sheeting drivers. Each compressor had its exhaust tied into an 8-in. pipe manifold which ran to the garage chimney.

The lower rings, lower lagging, and steel casing were left in place as ready-mix concrete was poured into each caisson. The concrete trucks pulled right up to the front of the garage, where a window had been taken out to form an opening that provided front door delivery for transfer of the concrete into Gar-Bro power carts. Three of these gasoline operated buggies moved the mix to discharge points in hoppers located over the caissons being poured. Heavy steel reinforcing dowels were placed as pouring progressed to the top of each caisson, which was held to a level approximately 5 ft below the garage floor. The remaining space was temporarily filled to the top of the floor with sand.

Overall caisson construction took 11 weeks to complete. James Morrison was Case's superintendent, and Vernon Godiksen was the civil engineer on the job. The architectural firm of Hirschfeld & Pawlan had John Data on the site. Miller Engineering Co was consultant.



PICTURE OF
LOST TIME
•
WASTED MONEY
•
ACCIDENTS
ABOUT TO HAPPEN

This picture was taken in 1935.
Today, 80-mile-an-hour Americans are still forced to use
DIE-WAYS like this! Yet many people ask:

**WHY DO WE NEED
GOOD HIGHWAYS?**

Cedarapids

IOWA

Now you can tell them →



43 REASONS WHY AMERICA NEEDS BETTER HIGHWAYS NOW!

Strangulation of our national economy by a gigantic nationwide traffic jam, and the crippling of our defense effort through failure to keep the Federal Highway Program going, would be more costly than any of us can afford.

But most American citizens *don't know why* we need good roads. They are apathetic. Because they do not understand, there is little public support for a well-planned, nationwide system of interstate, state and rural roads.

It is up to us to give the public the facts

... show our friends, neighbors, and associates the benefits the Highway Program will bring to each individual... how it affects his pocket-book, even his life. Only when every citizen knows the facts can public opinion influence *intelligently* the men who make the laws to keep the Highway Program rolling.

Here are 43 of the hundreds of reasons why we must have better highways now. Add your own reasons and use them all to help obtain the enthusiastic local support we need.

GOOD ROADS SAVE MONEY

1. Total annual avoidable waste over *all* roads in the U.S. amounts to \$3 billion. Interstate Highways would save \$550,000,000 in gas consumption, brake and tire wear, vehicle operation—save \$725,000,000 now wasted on traffic accidents—save \$825,000,000 in time lost by commercial vehicles.
2. Modern Interstate Highway engineering eliminates steep grades, sharp curves, intersections at grade, stop and go driving. Good highways can bring about annual savings of \$750,000,000 in direct operating costs of trucks and buses.
3. Payments of insurance covering property damage and personal injuries resulting from highway accidents equal 12½¢ per gallon of gas consumed. That equals \$116 for every motor vehicle registered.
4. It costs less right now to build a typical mile of Federal Aid Highway than it did during the first three months that the 1956 Highway Act was in effect.

GOOD ROADS SAVE LIVES

5. In 1920, the traffic death rate per 100 million miles was 28.2. In 1940,

the death rate was 11.4. Then we started building better, safer roads. Bertram D. Tallamy, federal highway administrator, predicts that the death rate will decline from the 5.6 per 100 million miles in 1958 to 5.0 in 1970 and to 4.4 in 1975.

6. The controlled access highway is at least 2½ times safer than the ordinary highway. On Virginia's Shirley Highway, with controlled access, the fatality rate is 0.8 deaths per 100 million miles. On the parallel U.S. 1, with no control of access, the death rate is 10.6.

7. Traffic accidents today are killing 38,000 people annually. Experts estimate that highways *engineered for safety* would save 4000 lives per year. By 1970, continued use of The Interstate System could save 37,800 people.

8. If traffic volume increases by 50% in the next ten years, there will be 55,000 fatalities a year—unless safer roads cut the rate.

9. In Chicago, the chance of having an auto accident on congested streets is 30 to 50 times greater than on the new Congress Street Expressway.

10. In 1959, accidents cost \$4.3 bil-

lion. Modern highways can eliminate a very large part of the monetary waste of accidents.

GOOD ROADS FOSTER ECONOMIC GROWTH

11. Modern highways are a sound, durable investment in the growth of the Nation.
12. The dollar value of goods and services for a specific period is called the Gross National Product. \$1 billion of highway construction contributes to the Gross National Product as follows: Steel, 510,000 tons; bituminous materials, 995,000 tons; cement 16,000,000 barrels; explosives, 18,345,000 lbs.; aggregates, 76,415,000 tons; petroleum products, 122,794,000 gallons; construction equipment, 34,584 pieces; trucks and cars, 22,500 pieces. These are based on each \$1 billion in excess of an annual rate of \$5.8 billion of construction.
13. The New York Thru-Way is officially credited with stimulating 650 million dollars worth of industrial, commercial and residential development, including \$50 million around Tarrytown alone.
14. With the New Jersey Garden

State Parkway, the gain in taxables and retail business in the counties it serves is *twice* that of New Jersey's remaining 11 counties.

15. On Route 128 near Boston, some 227 companies have built 17 industrial parks and 175 million dollars worth of buildings to house upwards of 28,000 people—workers with good wages to spend.

GOOD ROADS ARE ESSENTIAL FOR NATIONAL DEFENSE

16. In case of war, *all* sections of the country must be swiftly available for the defense effort.

17. Highways are relatively invulnerable to atomic attack. It would take 20,000 Hiroshima-type bombs to destroy the 40,000 miles of the projected Interstate System.

18. We need good highways to evacuate people from our cities; bring in food; bring in medical supplies and help; move large volumes of military vehicles and weapons.

19. Highways are extensions of production lines; defense production depends on them. During World War II, 8 out of every 10 parts needed to make a tank in Cleveland came by truck from 23 states. 75% of the workers in 749 defense plants drove to work in their automobiles. 60% of all out-bound tonnages from defense plants was road-borne.

20. A network of good highways will assure nation-wide mobility for all our defense resources.

GOOD ROADS BENEFIT LABOR

21. The American working man drives his own car to his job. He can offer his services throughout a greater area; he has a greater diversification of jobs to choose from.

22. With good highways, the laboring man can think in terms of minutes rather than miles of driving to and from his job.

GOOD ROADS BENEFIT FARMERS

23. American farmers operate over 6,406,000 motor vehicles (including 3 million trucks). 89% of all farm products now reach their markets by highways.

24. Better rural roads bring markets and sources of farm supplies closer together, make schools more

accessible to farm homes, make medical services readily accessible.

GOOD ROADS INCREASE BUSINESS

25. One out of every six businesses (mostly small, independent firms) serve the Transportation Industry. Good roads are a shot in the arm to the small businessman.

26. Of the people who do the buying, 60% own automobiles. American consumers spend \$38 billion per year to own and operate their cars, helping to support garages, service stations, manufacturers of automotive parts and accessories, etc.

27. 60% of American buyers purchase goods that are transported via highways, streets and alleys. Fast deliveries increase business.

28. 70 million Americans take vacations by car each year (over 75% of tourist travel is by car), averaging 1013 miles per round trip. Many others travel by bus. Altogether they spend \$9.2 billion on vacations. This is big business for motels, resorts, restaurants, and souvenir shops, to name a few!

29. The annual bill for recreation travel is \$14 billion. 22% of this is automobile expense. Big business for the automotive industry!

GOOD ROADS FURTHER FULL EMPLOYMENT

30. One out of every seven American jobs is in the field of Highway Transportation.

31. Truckers provide over 5,750,000 jobs. Highway Transportation Industries provide 9.7 million jobs. Employed is a labor force equal to the population of all New England states, Arizona, Colorado, Idaho, Montana, New Mexico, Wyoming.

32. Each \$1 billion spent on highway construction equals 102 million man-hours of employment on the site of construction and 126 million man-hours off the site—a total of 228 million man-hours of labor.

33. In 1958, an extra \$400 million in highway contracts, let as an anti-recession measure, provided 137 million man-hours of employment and broke the back of the recession.

GOOD ROADS BENEFIT ALL INDUSTRY

34. For the Trucking and Motor Carrier Industry alone, Interstate type highways provide these advantages: —Reduction in number of power units required; use of lighter tractors; increased tire life; reduction in fuel and maintenance costs; reduction of accidents and insurance premiums; year-round maintenance of on-time schedules for livestock and perishable goods.

35. The Private Consulting Engineer profession carries 40% of the engineering load of the new Interstate System.

36. Utilities are free from the burden of acquiring easements of private land because so many consumers are located on good highways. In Oregon, a utility study shows savings of about \$100 a mile on 3212 miles of public right-of-way, mostly passed on to consumers.

37. Practically every industry is stimulated by increasing motor vehicle registrations. In 1959, registrations totaled 70,416,000 (3.1% more than in 1958). In 1971, it is estimated that 101,200,000 motor vehicles will travel over a trillion miles annually (20.7% on the Interstate System). In 1976—114 million motor vehicles will travel 1.2 trillion miles a year.

38. By 1976, 230 million people will need industrial goods and services fostered by increased travel on highways, rural roads and city streets.

GOOD ROADS BENEFIT EVERY CITIZEN

39. 8 million children ride buses to school every day of the school year. They need *safe* all-weather roads.

40. Movement of goods and people is faster on modern highways.

41. Time saved means lower transportation costs and lower prices for truck-borne merchandise.

42. Annoying, dangerous traffic congestion is reduced.

43. Modern highways, engineered to last by the application of results of the AASHO test road research at Ottawa, are the cheapest investment a private citizen can make to insure his life, his security, his country's growth, and his children's future.



.... There is *one* big reason why **YOU** should get behind this program for enlightening the public on the benefits of a continuing Federal Highway Program. Highway construction is vital to your way of life and the growth of your community. Here you have the ammunition to inform and mold public opinion into supporting, and demanding, vital highway legislation. *Use it!*

BUILD BETTER HIGHWAYS NOW! Save Lives—Save Time—Save Money

Sponsored as a public service by IOWA MANUFACTURING COMPANY Cedar Rapids, Iowa, U.S.A.



A GLIMPSE OF THE FUTURE

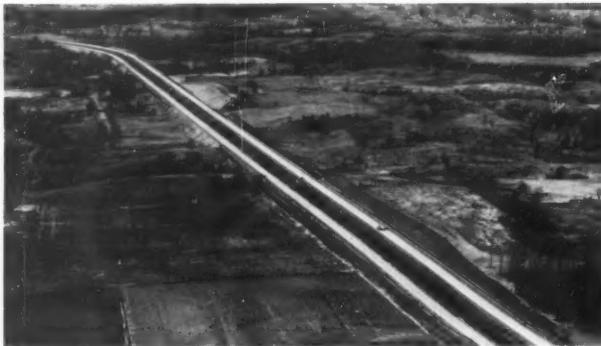
demanded by Mr. and Mrs. America



Through-city expressways provide fast transport of goods and services; save time, money and lives of city workers; foster economic growth.



Well-planned interchanges like this relieve traffic congestion to assure safe, easy access to transcontinental highways from urban areas, speeding produce from factory to consumer.



Straight, safe, controlled access Interstate Routes should cover the Nation for greater mobility in Peace or War. Goods and people, weapons and troops must move swiftly to every section of the country to strengthen our economy and defense efforts.



America today is a nation on wheels. Broad, safe highways open new recreational areas and expand tourist trade. Good, all-weather roads across mountainous terrain speed transcontinental commercial travel.

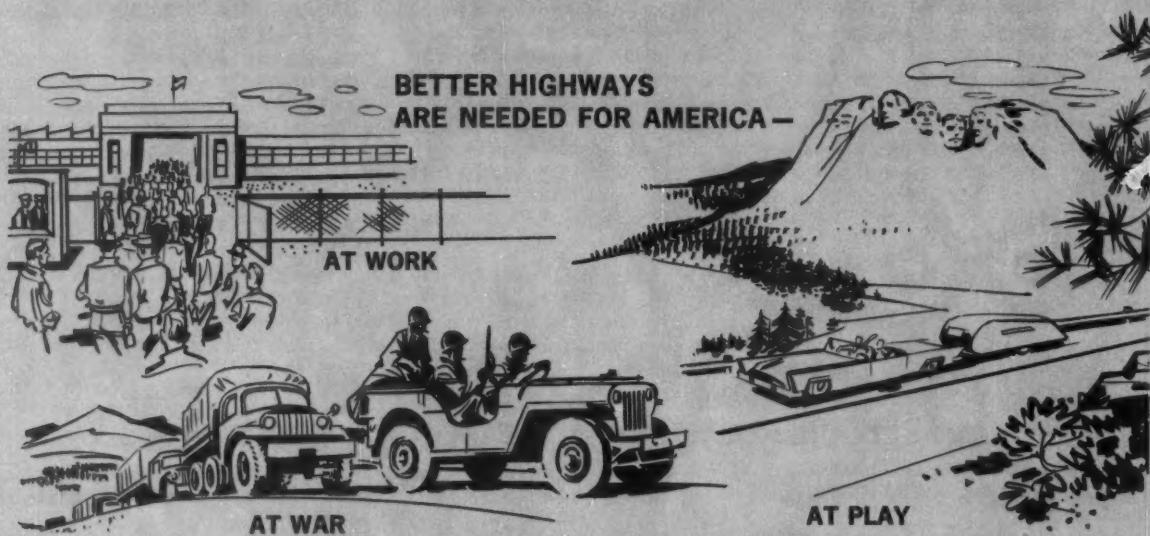
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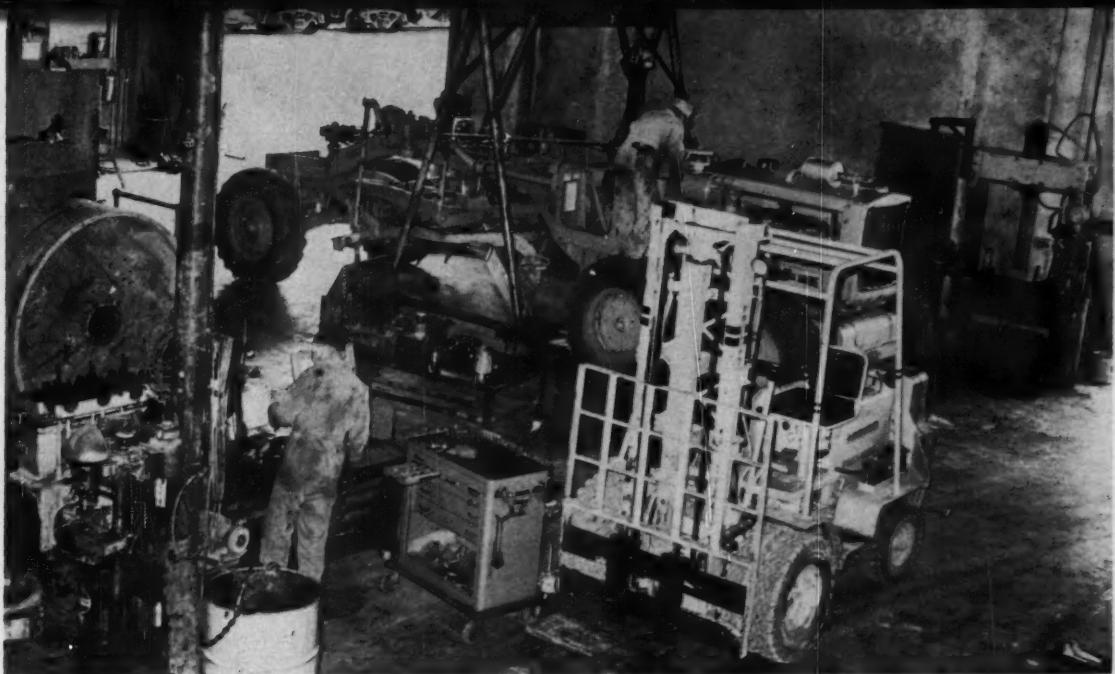
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SPACIOUS INTERIOR—The three spacious bays of Sondgroth's shop are unobstructed except for a few pipe columns. A portable A-frame with chain hoist handles lifts.

Shop Does Double Duty

This shop has the flexibility to handle day to day maintenance both in the field and at the yard, and is also equipped for major repairs.

TAILORED TO FIT their operation like a glove, the brand-new shop of Sondgroth Bros., Mountain View, Calif., combines the flexibility of a field shop and the more extensive facilities of a permanent shop.

Understanding why they need such a double-barreled setup takes some first-hand knowledge of their business. Sondgroth Bros. is a partnership of five

brothers. They have management agreements with four separate companies that they largely own. These include a construction company, an asphalt company, an aggregate producing firm, and an aggregate washing plant.

Much of their business, however, centers around asphalt produced by two Madsen plants, one 6,000-lb unit and one 4,000-lb unit. Although the Sondgroths run one of the largest paving outfits in northern California, they restrict their operations to within a 20-mi radius of their home base. They serve the swiftly growing Santa Clara Valley area just south of San Francisco.

This concentration in a small area means that, almost without exception, their trucks, pickups and other vehicles all return to the yard at night. So all vehicular maintenance is carried out at the shop.

On the other hand, equipment like tractors, graders, pavers and rollers remains in the field, when a lube truck services it. And a service truck loaded with shop



◀ Circle 148 on Reader Service Card

CLEAN EXTERIOR—Walls of the 80x96-ft shop building are made of precast tilted-up panels. Five doors serve the bays.

SHOP DOES DOUBLE DUTY... *continued*



HOIST ADAPTER—Workman fits adapters to cross-piece on one of three posts of Weaver hoist to accommodate axles of various trucks.

tools and equipment handles minor repairs in the field. Rigs are brought into the shop only in case of a breakdown requiring major repairs.

The upshot is that Sondgroth's shop must play a dual role. It must take care of day to day

maintenance both in the yard and in the field, and it must back up the field operation with facilities for complete overhaul of broken-down equipment. That's the kind of shop Sondgroth wanted, and that's what they got.

The 80x96-ft shop building is

surrounded on three sides by a paved yard where vehicles park at night. It's constructed of pre-cast tilt-up wall panels. The roof structure consists of glued laminated timber beams supporting timber joists and a roof deck. The roof structure did not have to be especially brawny because there was no provision made for overhead cranes or hoists.

At one end of the building a 24-ft-wide enclosed section is set aside for an office, restroom, small machine shop, and tire shop. There is also some room for parts storage, but a second deck over this section provides additional space. Except for the enclosed section, the floor area of the shop is virtually clear. It's obstructed only by a few pipe columns. There are three spacious bays for equipment undergoing repair.

The building has a dense, smooth concrete floor surface that is easily cleaned. Tractors brought into the building run on old tire casings that protect the floor. The tires pivot easily when the trac-

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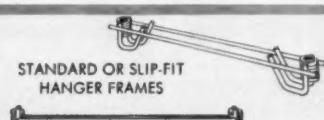
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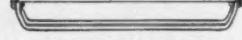
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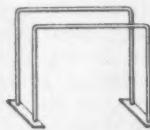
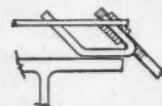
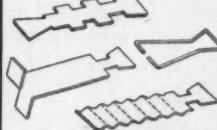


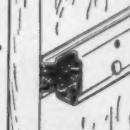
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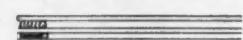
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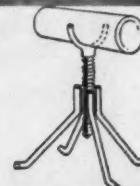
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MARION MOUNTAIN MOVER

A Marion 111-M is lowering mountains in 4-yd. bites these days in West Virginia. Hard at work on a section of interstate super highway, this Marion is slicing some 200 feet of rock and dirt to be used as fill on the road site at the base of the mountain.

Over the years Marion has incorporated job-tested design features into this big diesel unit that have increased the machine's operating efficiency significantly. It's the big reason why the 111-M can move more material faster and keep operating cost to a minimum.

Marion makes a wide range of machines to cover all possible contractor problems...bridge building...highway construction...pipe lines...you name it—and Marion machines can probably do it. Your nearest Marion distributor can give you full details on the exciting Marion line for the 60's, including the profit-producing design changes on the 111-M that make it **THE** machine in its class.

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A Division of Universal Marion Corporation

Circle 151 on Reader Service Card

PROPER Pre-Shipment TESTING Assures PROFITABLE PERFORMANCE *in the Field....*



IN addition to undergoing exacting tests for mechanical operating efficiency, each GALION Motor Grader, before shipment, receives a thorough engine operation and analysis check on a Clayton Dynamometer.

As a result downtime in the field, due to "new equipment" adjustments and tuning, has been reduced to a negligible point.

The tests and adjustments are made according to scientific standards. Guess-work, opinions and uncertainties are eliminated. You are assured a grader on which all mechanical parts function properly and the engine delivers top horsepower and speed with utmost fuel economy.

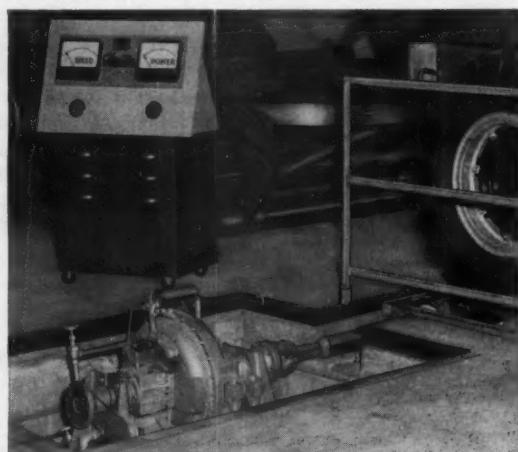
The grader is first tested and adjusted in its highest gear at full throttle for smooth operation with no load. Next the road speed and horsepower are checked under a full load condition. The Dynamometer operator easily controls the load or changes it at will by two remote control buttons.

Speed and torque measurements are electrically integrated, permitting horsepower readings to be shown directly on a large meter without computations being necessary. A matching electric meter shows road speeds in mph regardless of the tire size or rear axle ratio.

For profitable performance — buy GALION! See your Galion Distributor or write direct to The Galion Iron Works & Mfg. Company, Galion, Ohio, U.S.A.



After an initial warm-up period, the grader is moved into place with its tandem drive wheels resting on the Dynamometer testing rolls.



Working conditions are simulated by imposing loads on the Dynamometer rolls thru a closed hydraulic power absorption system.



HOIST BAY—Doors at each end of bay containing hoist let trucks drive through.

TIRE ROOM—Sondgroth reserves small room at one end of shop for tire repair.

SHOP DOES DOUBLE DUTY... *continued*

tor turns. Only one of the shop's five 14x18-ft rolling doors is used for track laying equipment; this restricts the floor area that might be damaged.

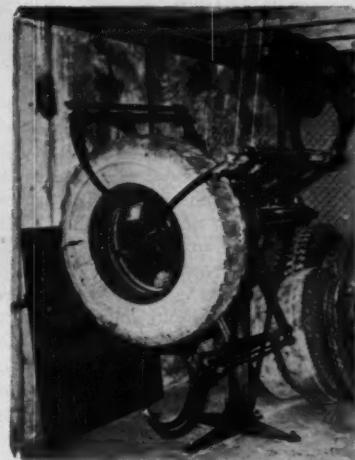
Perhaps the most valuable item of shop equipment is a three-post Weaver hydraulic hoist that lifts vehicles off the floor for lubrication, tire changes, or adjustment and repair from

underneath. A large rolling door at each end of the hoist provides drive-through convenience.

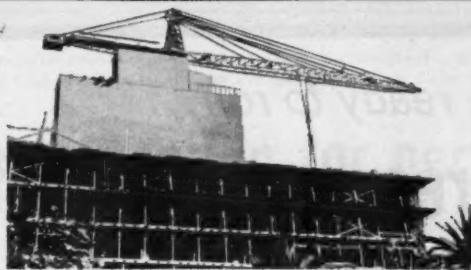
Making use of all three posts, Sondgroth can hoist three axles of a heavy truck-trailer unit at one time, leaving the wheels of the rear trailer axle on the floor. In this way they avoid the laborious job of unhooking their truck-trailer combinations,

which consist of a three-axle bottom dump truck and a two-axle bottom dump trailer. Semis are relatively easy to unhook, so they simply remove the trailer before hoisting the truck.

The location of the center post is fixed. The other two posts are movable so that spacing can be adjusted to fit varying wheel bases. Metal plates slide along the floor



Recommended for all types of apartment houses (North State Builders, Ltd., Palo Alto, Cal., building pictured on right), industrial and office buildings, silos, water towers, bridges, viaducts, etc.



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SHOP DOES DOUBLE DUTY... *continued*

to cover the hoist mechanism. A variety of inserts for the hoist cross-piece fit many different types of truck axles.

A 4-ton PhiLift lift truck is on hand for carting and hoisting. It's particularly useful for stocking parts on the mezzanine. Also available for hoisting operations is a portable A-frame with a 2-ton Budgit electric hoist.

The small machine shop boasts an 18-in. South Bend lathe, but otherwise there are no machine tools except some Sioux valve grinding equipment. Any heavy milling or machine work is sent out to shops in the vicinity. However, the shop equipment includes a 100-ton shop-built press.

The shop also has brake lining machinery manufactured by the Chicago Rivet & Machine Co., miscellaneous tire equipment, and the usual run of grinding and cutting tools.

A full complement of welding equipment includes a 400-amp Miller stationary unit in the shop, a 300-amp Miller unit mounted on a service truck, and two 300-amp Hobart welders. One of the



MOBILE LUBE RIG—Rig that services units in the field pauses at gas pumps outside shop. The truck is equipped with fuel storage tanks and Alemite greasing equipment.

A complete package ready to roll...

Heats and stores asphalt on the job

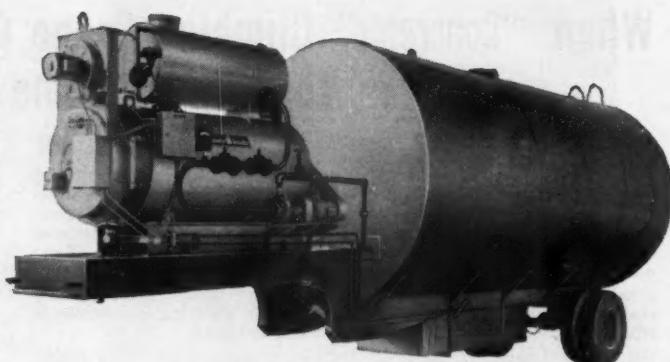
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All the dry mix leaves the box because of the smooth, dent-free surface of USS "T-1" Steel bottom plates. Extra clean-out men are not needed. Understructure, sides, batch and tail gates are USS COR-TEN Steel for strength and light weight. Truck Body Fabricator: Capital Industries, Inc., Seattle, Washington.

The best combination for performance . . .

Dump truck bodies made of USS "T-1" and COR-TEN Steels

"Pouring 4,100 feet of concrete highway is a good day's work," says Louis Tomaso, pouring superintendent for Northwest Construction Company, Seattle, Washington. "This kind of production takes the best equipment. That's why we are sold on dump boxes made with U. S. Steel's 'T-1' and COR-TEN Steels."

"With 'T-1' Steel in the bottoms and COR-TEN Steel in the sides and gates, we get a clean dump every time," says Mr. Tomaso. "The surface remains smooth and dent-free. None of the mix hangs up in the truck."

Northwest's trucks also double as earth movers and here's where they meet their real test. The maintenance superintendent, Homer Baer, says,

"USS 'T-1' Steel is tough enough to take the impact of heavy rocks falling from the shovel and the $\frac{3}{16}$ -inch bottom plates have never ruptured, stretched or dented."

Less weight—more payload. The combination of USS "T-1" Constructional Alloy Steel and COR-TEN High Strength Steel cuts 1,020 pounds of dead weight from the trucks and allows bigger payloads. "T-1" Steel has a minimum yield strength of 100,000 psi and COR-TEN Steel's yield point is 50,000 psi minimum. Both steels are workable and weldable and offer superior resistance to abrasion and atmospheric corrosion. For more information, write to any district office of United States Steel or to Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

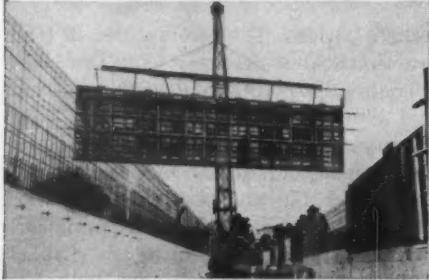
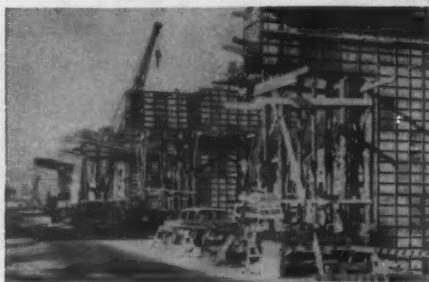
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SHOP DOES DOUBLE DUTY... *continued*

Hobart outfit is mounted on a trailer—it's primarily used at the asphalt plant and the quarry. The other Hobart unit, also mounted on a trailer, is on hand in the shop as a reserve in case of emergency.

Outside the shop building is a lineup of fuel pumps rivaling those of a typical gas station. Tanks provide a storage capacity of 10,000 gal of diesel fuel, 10,000 gal of regular gasoline, 5,000 gal of Ethyl gasoline, and 5,000 gal of lube oil. Delivered in bulk, all petroleum products are supplied by Standard Oil Company of California, who also furnished the fuel pumps.

PM Program

Standard Oil engineers have helped Sondgroth set up their preventive maintenance program for trucks and other vehicular equipment. They have established a drain and service period for each vehicle, and set up a lubrication schedule based on operating hours. A crew working on night shift and on Saturdays handles this service work.

Sondgroth retained an outside laboratory to recommend servicing procedures for their heavy equipment in the field. The lube rig that handles this work is an International truck fitted with fuel storage tanks and greasing equipment. It includes a 450-gal tank for diesel fuel, a 250-gal tank for gasoline, a 100-gal tank for motor oil, and four barrels of grease and gear oil. Each storage tank has an independent air-operated pump. A Curtis compressor powered by a one-cylinder Wisconsin gasoline engine deliv-

ers compressed air for the pumps. Alemite supplied all the lubrication equipment.

A General Electric two-way radio system powered by a central transmitter in Sondgroth's office dispatches both the lube rig and the service truck that handles field repairs.

Sondgroth keeps records of accumulated operating hours, servicing and repairs for each piece of equipment. They include fuel consumption and all other ownership costs. A National Cash Register bookkeeping machine in the central office posts the cost data.

The shop foreman analyzes the

records to decide, among other things, when a rig is due for a complete overhaul. He tries to catch the rig in time to prevent excessive operating costs or a breakdown on the job. The records help Sondgroth make decisions as to the disposition of equipment. Some of the units are used as trade-ins for new equipment. Other units may be junked or cannibalized to provide parts.

Ed Sondgroth is the general manager of the partnership. The maintenance of all equipment is his responsibility. Shop foreman Tony Goularte is his chief lieutenant in this effort.

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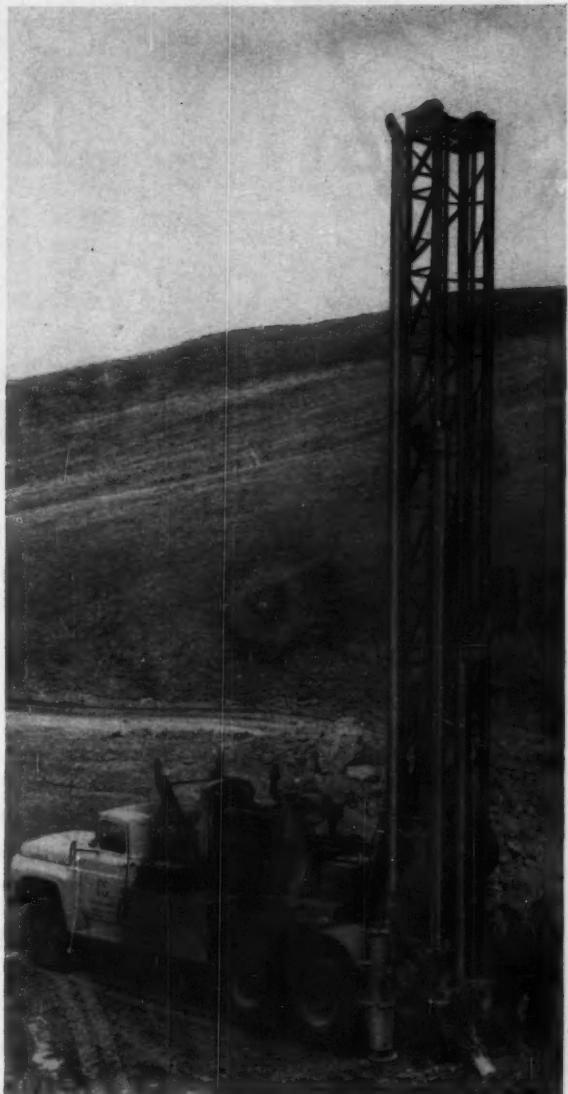
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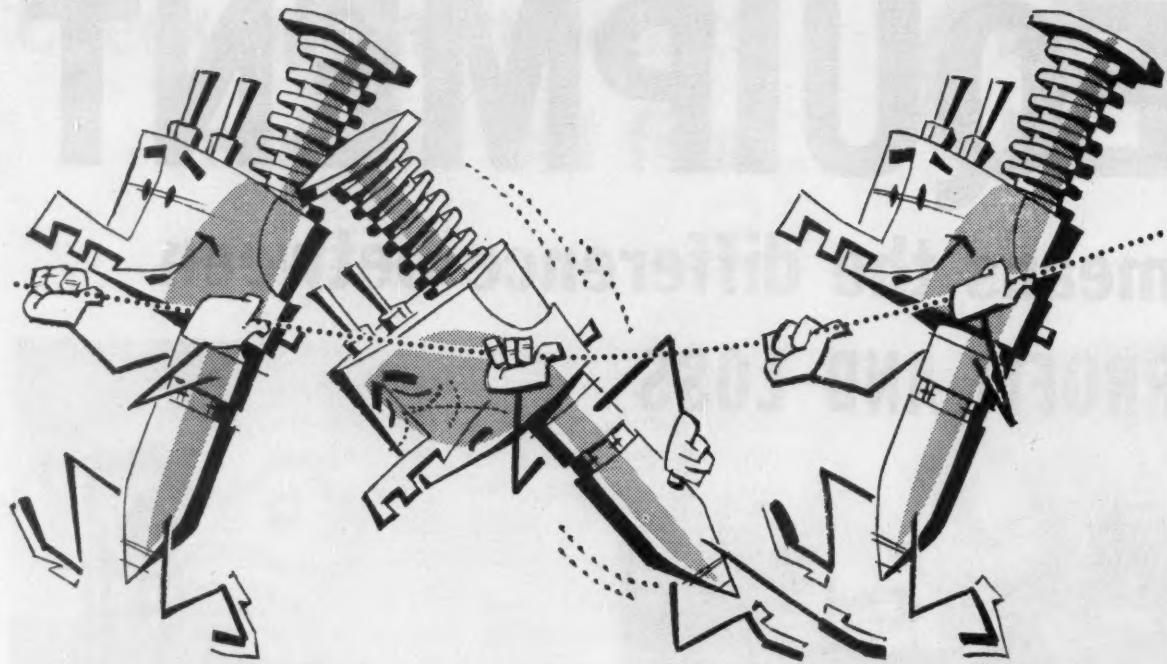
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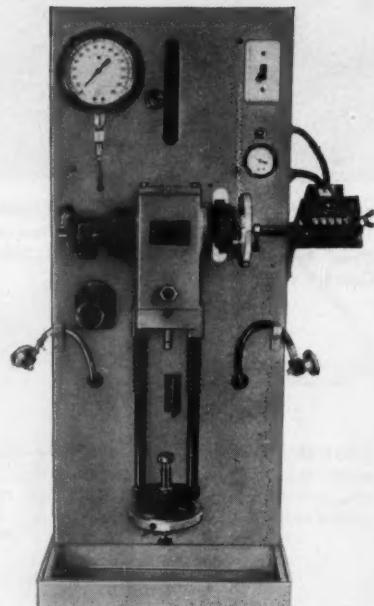
Visual inspection won't tell you which fuel injector is causing a once smooth, powerful Diesel to lose power, waste fuel, and run like a one-legged miler on a broken crutch.

But a Kent-Moore Injector Comparator can tell you—and in a matter of minutes.

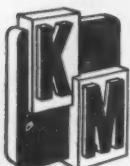
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By testing the fuel flow capacities of *all* the injectors. And indicating which one is guilty of delivering too much or too little fuel to its cylinder at a given throttle setting.

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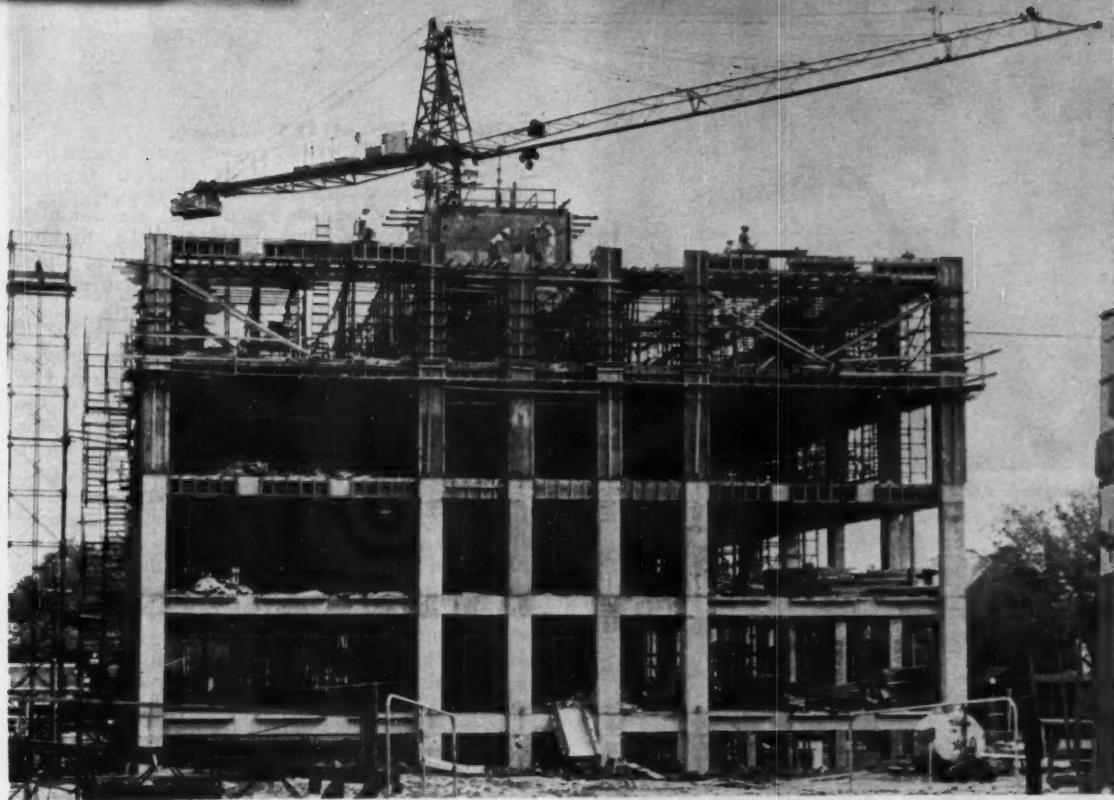
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H4



LONG REACH—A load-carrying trolley rides a rail under the crane's 82-ft boom and can pick up a load from the ground and position it anywhere on a floor under construction.

An imported climbing crane with several contractor-designed alterations handles all materials for erection of a 14-story building.

ANOTHER CLIMBING CRANE, this one from Denmark, has found its way onto an American construction site. The location is Omaha; the job is Kiewit Plaza, a 14-story office building that Peter Kiewit Sons' Co. is constructing for its own use.

Work was started in January, and the crane was brought to the job in April. The rig is a Linden Model F-30, manufactured by the F. B. Kroll Co. of Copenhagen. It was manufactured and shipped to Omaha at the request of Peter Kiewit who had seen a similar unit in action in Europe. The crane is here on a trial basis.

It was assembled in four days at the job site. Plans called for the jib and counter-jib to be assembled on the ground. Then the mast was to be assembled, also on the ground; it was to be anchored to the base and raised into a vertical position by the hoist motor located on the counter-jib.

But Kiewit assembled the mast in a vertical position. A truck crane lifted the 10-ft-long tower sections into place. The sections weigh 1,985 lb each and are connected by high-strength bolts. After the tower was assembled, the truck crane lifted the jib and counter-jib into position. The crane can be converted to a rail-mounted tower crane if necessary.

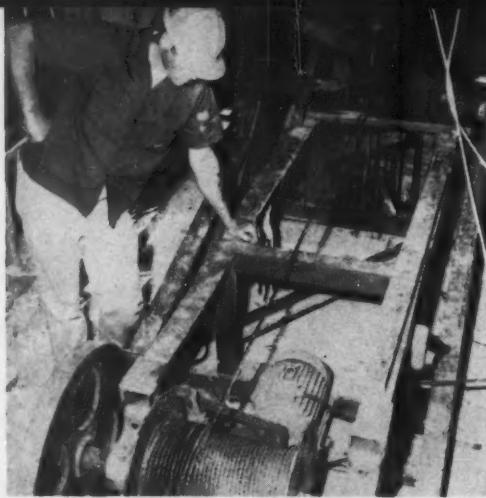
Crane Climbs Up a Shaft to Erect Building

Some concrete work had preceded the crane assembly because a support frame was necessary to stabilize the crane's 60-ft-tall tower once it was erected. For this, Kiewit completed portions of the building's basement. The floor for the elevator machinery served as a foundation for the crane; and 15 ft up, part of the structural frame of the basement floor served as a stabilizing collar for the crane's tower.

Twin elevator banks, a stairway, and lavatories make up the central core of the 84 x 148-ft building. Between the elevator shafts is a 4½-ft-square opening that will become part of the corridor when the building is completed. The crane's tower moves in this opening as the building rises around it.

Once the crane was assembled and in position, Kiewit's crews went to work on the building. The first three floors were completed with the base of the crane's tower resting on the elevator shaft foundation. After the third floor had taken shape around the crane, the climbing mechanism was lifted into position.

continued on next page



CLIMBING ASSEMBLY—Winch, motor, and reduction gear are in a frame in position on floor next to crane's tower.



SAFETY BRAKE—A 1x6-in. steel plate made in two parts fits around tower and keeps it from dropping down the shaft.



TOWER SUPPORTS—Two wide-flange beams span the opening in the floor and support crane when it lifts materials.

CRANE CLIMBS SHAFT *continued*

This mechanism consists of a 3-hp electric motor, a reduction gear, and a winch. All are mounted within a steel frame. The crane lifted the climbing assembly to the third floor and placed it on pipes. Then the assembly was rolled into position next to the crane's tower.

On the floor on the opposite side of the tower is another frame, which holds a set of six sheaves. Two more sets of six sheaves each are attached to the bottom of the crane, one set at each side of the tower. Additional sheaves are mounted in the climbing assembly. A $\frac{1}{2}$ -in. line from the winch passes over a sheave at the side of the tower; then it goes down to the bottom of the tower, passes over the two sets of sheaves, and comes up on the opposite side; there it passes over the sheave in the frame outside the tower and then repeats the path. The line reverses direction six times, giving a 12-part purchase. Its end is anchored to the climbing assembly frame.

Raising the crane one level and lifting the climbing assembly and sheave frame to the next position takes about $3\frac{1}{2}$ hr. At the end of a climb the cable is unreeved, and the climbing assembly is placed on pipes, rolled to the edge of the floor, and lifted to the next level. There the assembly is rolled into position next to the crane's tower, and the cable is reeved in preparation for the next climbing cycle.

Alterations

During the climbing cycle it is necessary to take safety precautions to prevent the tower from falling down the shaft in case of a cable break or failure of some part of the assembly.

At first, a four-man crew cross-stacked timber ties under the base of the tower as it rose above the floor on which the crew was standing. This proved to be quite a chore, and Kiewit engineers designed a safety brake to eliminate the cribbing.

The brake assembly is made of 1 x 6-in. steel plate in two sections that are bolted together to fit around the tower. It rests on 3 x 6-in. planks placed on the floor around the 4½-ft-square shaft. Safety dogs are pin-connected to the four corners of the brake assembly. The safety dogs are made of tool steel and are 1½ in. thick. They have serrated faces that grip the tower in case it starts to drop.

Each safety dog is angled so its serrated face drags on the corner beams of the tower as it rises. The brake does not resist the upward movement of the tower. But should the crane start to drop, the serrated faces dig into the tower frame and grip it like a pipewrench. During a trial run the climbing motor was backed off, and the crane—equipped with the Kiewit-designed safety brake—dropped only about $\frac{1}{4}$ in.

At the end of each climbing cycle, workmen place two wide-flange beams under the base of the crane's tower to span the opening in the floor. The beams are inserted beneath horizontal members of the tower base and support the full weight of the 20-ton crane. The cable used during the climbing operation supports no weight when the crane is lifting materials. To help stabilize the crane while in operation, hardwood shims are wedged between the tower and the building frame that acts as a stabilizing collar.

Standard tower height for the Model F-30 Linden climbing crane is 42 ft. But Kiewit ordered his crane with a 60-ft tower to give it a greater working height. This caused some difficulty with the climbing assembly because it was designed for a 42-ft tower, and the added weight placed too great a lifting strain on the winch.

Originally, the winch in the climbing assembly was only 2 ft from the tower. The fleet angle resulting from this arrangement proved to be too great for the added load of the extra-long tower. To rectify this situation, project engineers increased the distance from the winch to the tower, thereby decreasing the fleet angle. The original climbing assembly frame was cut in two and lengthened by 4-ft-long angles welded to it. Kiewit hasn't had any problems with the modified climbing assembly incorporating the new 6-ft winch-to-tower distance.

Crane Operation

On the working end of the Linden crane is an 82-ft-long jib. An extension can be bolted to it to extend its reach to 96 ft, but it was not used on this job though it was brought out to the site. A counter-jib, 45 ft long, extends in the opposite direction from the jib. The counter-jib carries a ballast of 7,760 lb made up of concrete slabs cast specially for this purpose. The 162-lb slabs are stacked six-deep in eight rows on a steel frame slung beneath the end of the counter-jib.

The crane's tower is structurally rigid, and it need not be exactly plumb during lifting operations. But when climbing, it is necessary to keep the tower from binding against the frame of the building. To prevent this, the jib carries a load to counterbalance the 7,760-lb ballast on the counter-jib during the climbing cycle.

Electric motors power all crane operations. All motors run on a single 220-v power source, but 440-v current can be used if desired. The hoist motor sits on top of the counter-jib over the ballast. The standard hoist motor for the crane is rated at 20 hp, but Kiewit is planning to substitute a 30-hp unit to obtain greater lifting speeds at maximum load. The motor is equipped with a brake to prevent sudden or unexpected dropping of the load.

The slewing motor also sits on top of the counter-jib, but it is directly behind the tower. The jib can rotate a full circle.

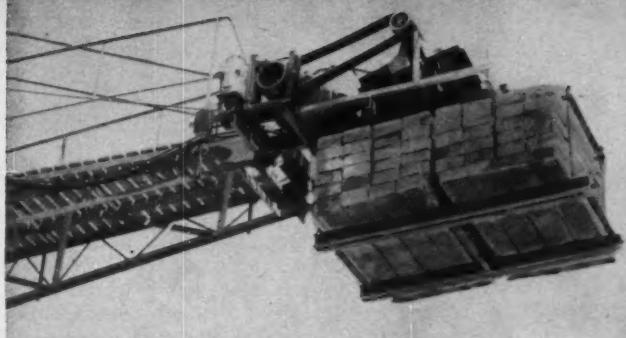
Last of the motors is a 2-hp unit that powers a load-carrying trolley riding on a single rail beneath the jib. In cross-section the jib's frame resembles a triangle, the trolley rail forming the lowest corner of the triangle.

In a standard arrangement, hoist lines pass over tandem sheaves in the trolley. But with a minor change that can be made in just a few minutes, a third sheave can be added between and slightly below the tandems. Kiewit added the third sheave to boost the crane's lifting capacity.

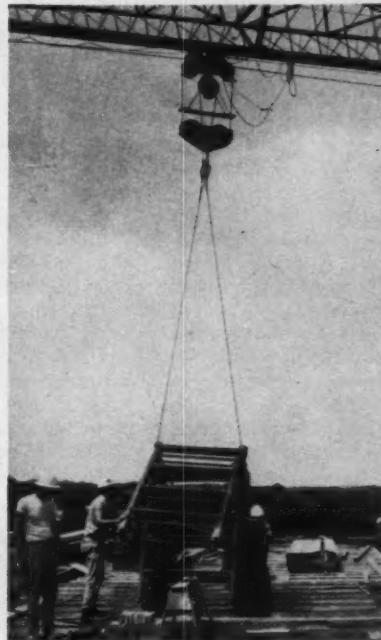
When the trolley is at the end of the jib, the crane can lift 4,400 lb. Closer to the tower the lifting capacity increases until it reaches 7,700 lb at 42 ft.

continued on next page

CONTROLS—Small panel in contractor-built cage holds all switches to control crane's electric-powered operations.



COUNTERWEIGHT — Cast concrete slabs, weighing 7,760 lb, make up crane's ballast.



LOAD CARRIER—Three-sheave trolley rides a rail that is part of the triangular crane boom.



CRANE CLIMBS SHAFT... *continued*

Controls

Simple controls actuate the crane's motors. All are operated from a single control box, or panel. It measures about 4 x 6 x 14 in. and is equipped with three switches—one for each of the motors. The controls are easy to operate, but Kiewit's crane operator felt that they lacked the "feel" that the controls of conventional cranes have.

The control box is hung from a 100-ft-long cable that permits the operator to control the crane from anywhere in the working area. To give the operator a good vantage point when not moving about the floor, Kiewit built a special platform directly beneath the jib. And they added floodlights at the top of the tower for night operations.

One drawback in the crane's operation seemed to be its inability to place loads accurately in winds of 20 to 30 mph. At such times, according to the supervisor, the slewing is uncontrollable.

When this occurs, the slewing motor is turned off, and the jib is kept stationary with only the trolley and hoist motors in operation.

Disassembly

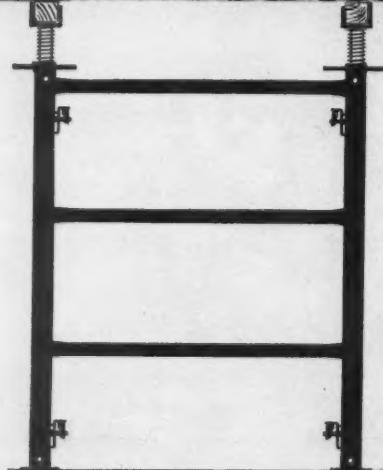
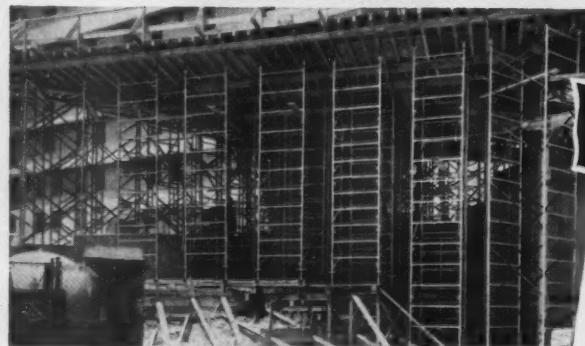
Completion of the building's structural skeleton is scheduled for September. At that time the crane will be dismantled on the roof of the completed building, and it will be lowered to the ground piece by piece. Kiewit is planning to stick to the dismantling procedure recommended by the manufacturer. According to this, the crane will be lowered into the shaft until the jib and counter-jib rest on the roof. Then they will be detached from the tower and dismantled. Next the workmen will raise the tower with the climbing motor assembly still in position on top of the building. As each tower section rises above the roof, it will be unbolted from the rest of the tower. Then an A-frame, or

breast derrick, rigged up from the crane components and the hoisting motor, will lower the disassembled crane to the ground. The hoisting motor and A-frame have to be removed by another crane. Kiewit expects to have a four-man crew take care of the dismantling.

In the meantime, construction crews are working two 8-hr shifts per day and are completing one floor of the 84 x 148-ft building every six days. A total of 6,000 cu yd of concrete will go into the reinforced concrete structure. The building is scheduled for occupancy in June 1961.

Kiewit people are well pleased with the crane and feel that it is well suited to similar building applications involving large amounts of concrete and other materials. And the manufacturer also is pleased with the crane's performance on the job.

Running the job for Kiewit is Bob Patch, project engineer. Earl Jones is steel erection foreman.



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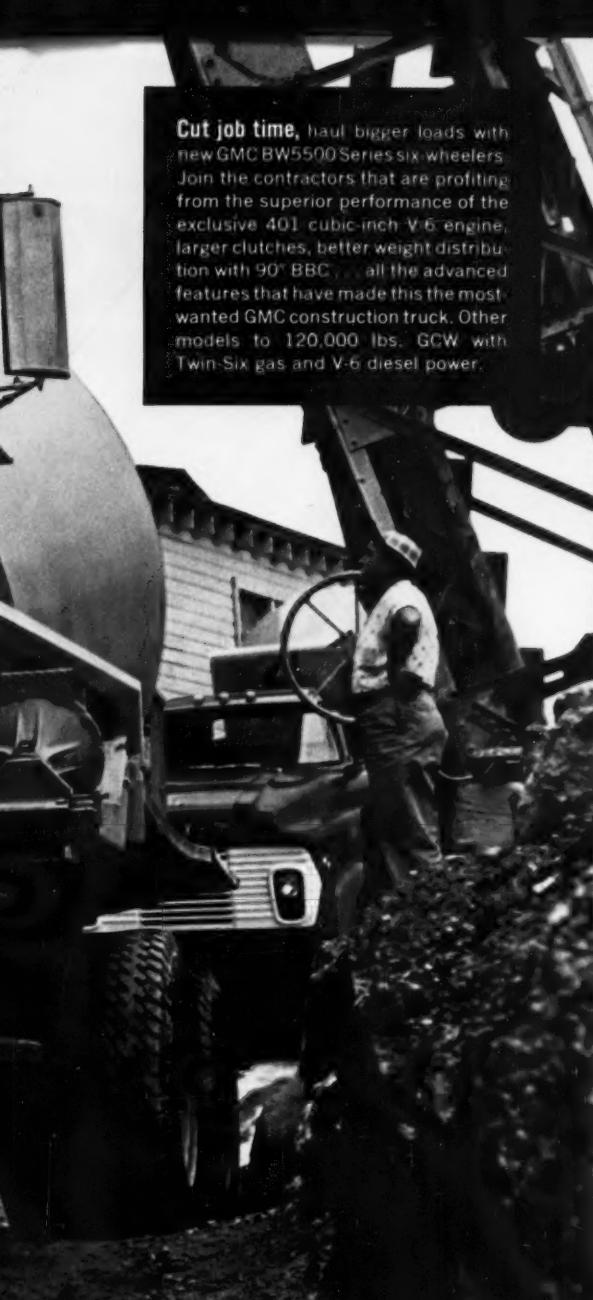
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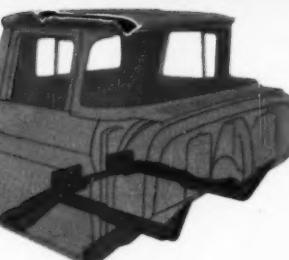
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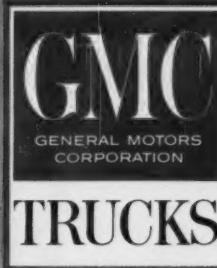


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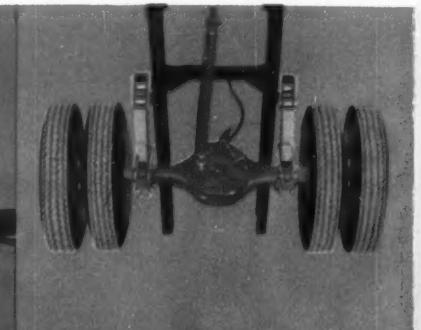
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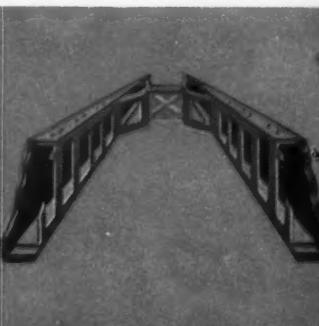
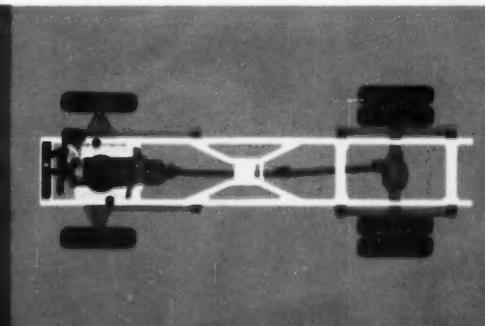
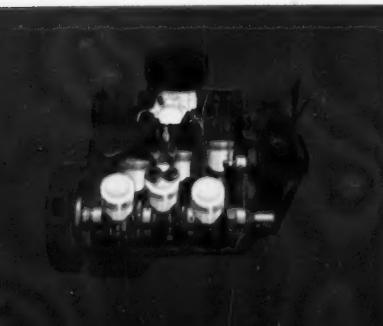
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Station Moves 34 Ft With No Break in Operations



UNUSUAL MOVING JOB—Mural and Son, Inc., moves this Sohio service station back 34 ft on its lot with services still connected. Trick is to excavate under building, move foundation slab and walls intact.

A CLEVELAND CONTRACTOR has come up with a neat technique for moving a service station without interrupting the operation of the station.

Mural & Son, Inc., moved a 38x64-ft, three-bay service station 34 ft back on its lot with the service station crews working inside the building. Mural had a sub-contract with Industrial Construction Co. of Cleveland, who is revamping the station for the Standard Oil of Ohio. The station is located on Lakeshore Blvd. in Euclid, Ohio.

The building was supported on a slab at grade level plus 3½-ft-deep foundation walls under the exterior walls. The conventional way to move such a building would be to cut the walls about 2 ft above the floor and place beams under the walls to carry the weight of the building. The slab and foundation walls would be replaced with new ones at the new site.

This normally would be the cheapest way to move the building. But the services would have to be disconnected and the building would be unusable for several weeks during the move.

Sohio wanted the building moved with a minimum of lost operating because this is an unusually busy station (it keeps a 6-man staff busy 24 hr a day). Mural managed the move with almost no interruption of station operations.

Their approach was to excavate under the building and lift the entire structure including foundation walls and slab. All the interior installations, including water and electrical services and a cement-terrazzo floor, remained in place and in operation during the move.

This method is more complicated than the conventional methods partly because of the extensive excavation required, and partly because more support was required than under the non-uniformly loaded slab than would have been required under the load-bearing walls. Mural had to analyze the slab loading to determine the proper support points.

Excavation

Mural first excavated a 4-ft-wide trench around the building so they could get at the founda-

tion walls. Then they cut holes in the rear walls large enough for an Allis-Chalmers HD-5 loader to get under the building.

The loader excavated the earth under the slab, carrying it to the back of the lot where a Unit 1½-yd backhoe loaded it into trucks for removal.

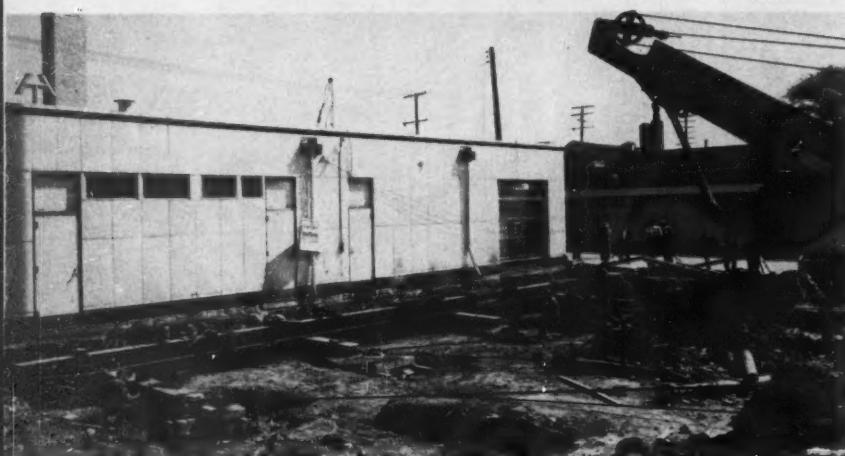
As the soil was removed, Mural inserted twenty-four 15-ton Simplex screw jacks under the slab at the pre-determined load points. The weight of the building was transferred from the ground to the jacks.

When the excavation was complete and the building was supported on the jacks, Mural drilled more holes in the foundation walls and inserted a steel grillage system. Running across the building were 12-in. H-beams, spaced about every 3 ft. Under these, running from front to back of the building, were four evenly-spaced 16-in. H-beams.

The lateral beams supported the slab and the front-to-back beams formed the skids. To provide a skid surface, 3-in. maple planks were fastened with countersunk bolts to studs welded to the bottom of the beams. The



EXCAVATION — Allis-Chalmers loader gets under building through holes cut in foundation walls to remove the earth under floor slab. Weight of building is transferred to 24 mechanical jacks.



STATION MOVES 34 FT . . . *continued*

beams slid on timber blocks spaced about every 4 ft. The wood surfaces were lubricated with ship launching grease.

Before the building was moved it was jacked up 8 in. to provide for an 8-in. difference in grade between the old and new sites. Mural used mechanical jacks for this job because they are easier to control. A crew of 10 to 12 men successively turned each screw jack a given amount to keep the building rising evenly.

The building was moved by two winches, one of 30,000 lb capacity and one of 20,000 lb capacity, each rigged with two-part line. The winch cables were rigged through a single hook to the loop of a cable connected to the H-beams so that the pull on each beam was even.

The station was completely operational right up to the day of the move. Steel plates spanned the 4-ft trench at the entrance to the bays so cars could enter. During the move, a coiled flexible water line supplied water to the water system, and a coiled length

of power cable supplied continuous power to the electrical system.

The only parts of the station that were unusable during the move were the hydraulic lifts, and these were out of commission only for the 24-hr period when the building actually was moving. The concrete bases for the lifts, which extend about 9 ft below grade, were supported during the move by wrapping a steel collar around the lift pistons and attaching them to the H-beam skids with 3-in. bolts.

At the new location, the load of the building was transferred to the jacks, which had been set up again on timber cribbing. The building was adjusted to the required elevation, and expansion concrete was poured under the foundation walls to provide solid footing.

In addition to the foundation walls, Mural installed 50 concrete-block piers to support the interior walls (at the old site the interior walls were carried entirely on the slab). Then the steel

beams were removed from under the building.

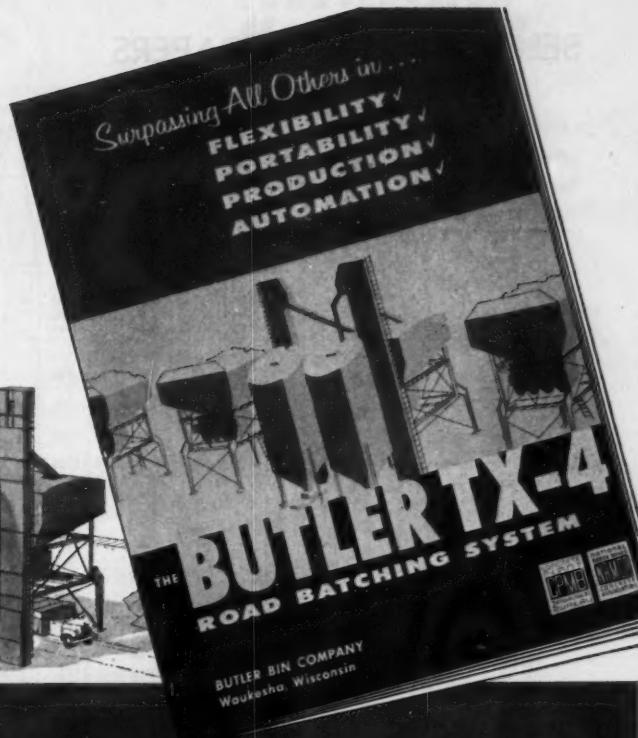
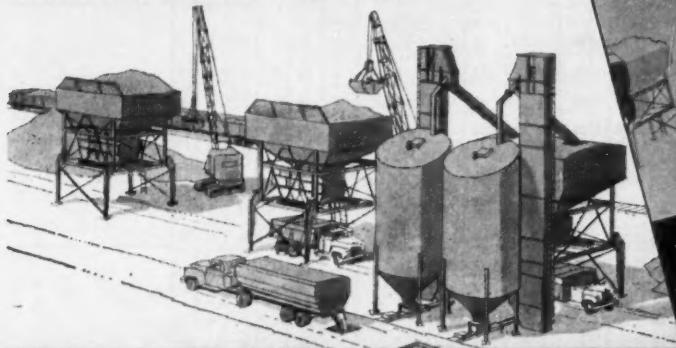
The excavation under the building was filled in with sand up to the slab. This fill was not intended to provide support for the slab; it was put in to eliminate voids under the building where gasoline fumes might collect.

The entire operation took about two months. This was longer than Mural had originally figured, but it didn't make any difference to the owner because the station was in full operation for the whole time. Sohio was happy about the results. The slightly greater cost of this method of moving was much more than offset by the fact that there was no loss of sales time at the station.

Unusual moving jobs are getting to be a habit with Mural and Son. They previously moved a 30 x 50-ft swimming pool up a $\frac{1}{2}$ -mi hill in Hunting Valley, Ohio, and a jail to a new site in Little Rock, Ark., with the prisoners in it all the way.

Bill Mural was in charge of the service station job.

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2 TS-260	22.3	30	34	428	Hyd	55,980	AC-21,000	340	2,000	6 844.3	3	5.4	10.6	18.5	26.3	3.1	Electric	
3 TS-360																		
4 CATERPILLAR																		
4 No. 442	14	18	21	360	CABLE		CAT D326-H	225	2,000	6 805	3.0	6.1	9.1	13.9	19.9	7.1	Electric	
5 *No. 456							CAT D337-H	345	2,000	6 805	3.2	6.1	10.0	17.0	27.9	4.1	Electric	
6 No. 470							CAT D337-H	345	2,000	6 805	2.6	5.0	8.1	13.8	22.6	3.3	Electric	
7 *No. 482							CAT D337-H	345	2,000	6 805	3.2	6.1	10.0	17.0	27.9	4.1	Electric	
8 MICHIGAN							Cummins JT-6-81	162	2,200	6 401	4.5	8.6	16.4	31.4	(T.C.)	435	Electric	
9 Clark Engin. Co.	8	10.5	13	340	HYDRAULIC		Cummins NTD-6-81	262	2,100	6 743	4.5	8.6	16.4	31.4	(T.C.)	615	Electric	
10 310	13.5	19	22.5	402	CABLE		Cummins NFT-6-81	375	2,300	6 743	3.9	8.3	15	31.2	(T.C.)	700	Electric	
11 CURTISS-WRIGHT							GM-71	148	2,100	4 284	2.9	5.6	10.9	19	25.3	2.9	Electric	
12 CW-215	8.2	10.3	13	318	CABLE	41,780	Cummins 4B-5	240	1,800	6 743	3.0	5.1	8.7	15.1	23.8	4.0	Electric	
13 *CW-320	15	21	21	397	CABLE		Cummins NRT-6	300	2,100	6 743	4.0	6.7	11.4	19.9	31.2	5.2	Electric	
14 CW-220	20	27	31	444	CABLE	49,900	GM-6-110-T	360	2,000	6 660	5.7	11.5	23.0	34.4	-	6.7	Electric	
15 CW-226	20	27	31	438	CABLE	59,515	GM-12V-71	430	2,100	12 852	6.0	12.8	21.0	36.1	-	7.0	Electric	
16 EUCLID							GM-471	148	2,100	4 284	4.2	8.2	16	22	(T.C.)	744	Electric	
17 S-7	7	9	10.5	336	HYDRAULIC		GM-6-71	227	2,100	6 426	2.9	4.8	8.3	14.4	22.6	3.9	Electric	
18 S-17	12	17	20	374	CABLE		GM-6-71	227	2,100	6 426	2.7	5.3	10.2	17.8	28	3.5	Electric	
19 *SS-12	12	17	20	396	CABLE		Cummins NHR-5	320	2,100	6 743	4.2	8.6	16.4	31.4	-	5.2	Electric	
20 *SS-18	18	25	27.5	496	CABLE		NHR-5	320	2,100	6 743	4.2	8.6	16.4	31.4	-	5.2	Electric	
21 S-18	21	30	35	436	CABLE		GM-6-110	336	2,000	6 660	3.9	8.2	16.4	24.5	(T.C.)	960	Electric	
22 *SS-24	24	32	40	576	CABLE		GM-6-110T ^(c)	360	2,000	6 660	5	10	19	29.8	(T.C.)	1,600	Electric	
23 TS-14(d)(e)	24	32	40	534	CABLE		GM-12V-71	432	2,100	12 852	5	11.2	22.5	33.5	-	-	1,120	Electric
24 TS-24(d)(e)	24	32	40	444	CABLE		GM-4-71	148	2,100	4 284	4.1	8.2	16.0	22.2	-	-	1,180	Electric
25 INTERNATIONAL HARVESTER							GM-4-71	148	2,100	4 284	4.1	8.2	16.0	22.2	(T.C.)	1,180	Electric	
26 55	10.3	14	21	499	CABLE		GM-4-71	175	1,800	6 743	2.8	5.2	8.8	14.2	24.1	2.8	Electric	
27 75	15	20	27.5	559	CABLE		GM-6-81	262	2,100	6 743	2.7	4.5	7.8	14.9	23.4	2.3	Electric	
28 295	24	34	36	456	CABLE		DI-817	375	2,100	6 817	4.0	10.2	20.4	30.5	(T.C.)	1,920	Electric	
29 *495	24	34	36	472	CABLE		DT-817	375	2,100	6 817	4.3	11.3	22.7	33.8	(T.C.)	1,920	Electric	
30 LeTOURNEAU,R.G., INC.							GM-12V-71	420	2,100	12 851.2	D.C. ELECTRIC DRIVE					1,250	Electric	
31 L-28 ^(d)	20.5	30	657	657	ELECTRIC		NR-TO	600	2,100	12 1,086	Infinite Range To Fit Application					1,400	Electric	
32 L-50 Self-Loading	41	55	70	1,200	ELECTRIC		Cummins VT-12-81	600	2,100	12 1,086	D.C. ELECTRIC DRIVE					1,920	Electric	
33 L-130(d)(e)	105	130	122	408	ELECTRIC		Cummins VT-12-81	600	2,100	12 1,086	Infinite Range To Fit Application					1,920	Electric	
34 Self Loading							Cummins VT-12-81	600	2,100	12 1,086	D.C. ELECTRIC DRIVE					1,920	Electric	
35 LeTOURNEAU- WESTINGHOUSE							GM-12V-71	430	2,100	12 851	Infinite Range To Fit Application					1,920	Electric	
36 D (Power Shift)	7.3	9	10	291	HYDRAULIC		GM-4-71	143	2,100	4 284	2.9	5.4	10.5	18.3	26.1	2.8	Electric	
37 C (V-Power)	7.3	9	10	291	HYDRAULIC		GM-4-71	143	2,100	4 284	5.1	10.1	21.6	30.0	-	5.0-6.9	Electric	
38 35	14	20	22	391	HYDRAULIC		GM-4-71	270	2,100	8 567	2.6	5.1	9.8	17.1	27.0	2.6	Electric	
39 40	14	20	22	492	HYDRAULIC		GM-4-71	276	2,100	6 743	2.8	5.4	10.3	18.0	28.3	2.8	Electric	
40 41	14	20	22	492	HYDRAULIC		NHS-6-81	276	2,100	6 743	H-3.7	7.2	13.7	24.0	37.7	3.7	Electric	
41 42	14	20	22	492	HYDRAULIC		NHS-6-81	276	2,100	6 743	H-2.1	3.8	7.8	11.1	21.8	2.0	Electric	
42 43	14	20	22	492	HYDRAULIC		GM-12V-71	430	2,100	12 851	H-2.0	5.4	8.4	15.5	31.7	8.1	Electric	
43 44	14	20	22	492	HYDRAULIC		GM-12V-71	430	2,100	12 851	H-2.0	5.4	8.4	15.5	31.7	8.1	Electric	
44 M-R-S	30	38.5	45	468	HYDRAULIC		Cummins NT-380-81	380	2,300	6 855	8.8	11.9	15.67	21.94	31.8	8.09	ELEC.	
45 190A	30	38.5	45	468	HYDRAULIC		Cummins VT-8-430-81	430	2,500	8 950	9.11	12.17	17.04	23.86	34.58	8.8	ELEC.	
46 190B	30	38.5	45	468	HYDRAULIC		Cummins VT-8-430-81	430	2,500	8 950	9.11	12.17	17.04	23.86	34.58	8.8	ELEC.	
47 200C	35	43.5	52.5	492	HYDRAULIC		Cummins NVH-525-81	525	2,100	12 1,086	8.7	11.9	16.8	23.5	34.0	8.65	AIR	
48 250A	40	50	60	492	HYDRAULIC		Cummins VT-12-81	600	2,100	12 1,086	8.7	11.9	16.8	23.5	34.0	8.65	AIR	
49 250B	45	55	69	492	HYDRAULIC		Cummins VT-690-81	690	2,100	12 1,086	8.7	11.9	16.8	23.5	34.0	8.65	AIR	
50 OLIVER 990 Scraper (SS-767)	5.3	7	-	402	Hyd	16,995	GM-3-71	89(j)	1,675	3 213	2.5	3.3	4.4	10.0	7.3(k)	2.7 & 4.9	Elec.	
51 SEAMAN-GUNNISON 600-6	5	6	7	264	Hyd	16,500	IH 645-D	88	2,400	6 282	Ten speeds forward,					3.8	Elec.	
52 MM5-6	5	6	7	264	Hyd	16,500	MM Diesel M-5	80	1,800	4 336	1.5 to 20 mph					3.8	Elec.	

* Two-Axle Tractor

(a) 30.2 in 6th gear

(b) Prime mover only; both, double

(c) Available with 335-HP Cummins NRTO-6-81

(d) All-wheel drive

(e) Two Engines

(f) Top of Control panel

(g) Front to rear

(h) Available with 335-HP Cummins NRTO-6-81

(i) Net engine HP

(j) 13.0 in 6th gear

Specs for Your Files...

Construction Methods AND EQUIPMENT

Max. Width of Cut, In.	Max. Depth of Cut, In.	Max. Depth of Scraper, In.	OVERALL DIMENSIONS												CABLE					
			FORCED POSITIVE			FORWARD POSITIVE			FORWARD POSITIVE			FORWARD POSITIVE			FORWARD POSITIVE					
			Length, In.	Width, In.	Height, In.	Length, In.	Width, In.	Height, In.	Length, In.	Width, In.	Height, In.	Length, In.	Width, In.	Height, In.	Length, In.	Width, In.	Height, In.			
971/2	9 3/8	165 1/8	377	120	117	64	96x32 1/2	220	18.5-25	18.5-25	72	72	28,500	66	34	50	50			
116	8 3/4	18	408	138	119	53	116x45	252	26.5-25	26.5-25	89	88	44,800	64	36	50	50			
123	10	21	403	144	130	63	120x65	296	29.5-35	29.5-35	109	88	62,150	62	38	50	50			
112	ANY PRACTICAL DEPTH	18	440	130	116	53	108x51	269	26.5-25	26.5-25	78	78	47,150	68	32	53	47			
124		20	526	141	136	58	120x69	282 3/8	29.5-28	29.5-28	88	88	58,170	42	35	37.5	48.5			
124		20	503	141	137	58	120x69	307	29.5-29	29.5-29	98	88	59,980	67	33	52	48			
130		22	553	154	150	64	126x78	311	29.5-28	33.5-33	98	88	68,505	40	41	37.0	51.5			
84	11	181 1/2	390	101	102	51	84x40	233	23.5-25	23.5-25	81	72	31,000	68	32	53	47			
114	14	23	449	134	113	49	114x52	276	26.5-25	26.5-25	94	91	45,800	68	32	52	48			
120	16 1/2	281 1/2	526	144	135	60	120x65	325 1/2	33.5-33	33.5-33	104	94	76,300	68	32	53	47			
87	15	211 1/2	358	102	104	47	87x85	216	18.0-25	18.0-25	76	66	32,500	70	30	56	44			
120	16	20	460	142	120	61	285	29.5-25	92	92	56,000	66	34	54	46	9/16	9/16			
120	18	221 1/2	519	143	131	64 1/2	120x121	268	14.0-24	29.5-29	94	64,000	46	34	42	45	1/2	1/2		
120	19	24	574	143	130	64 1/2	297	27.3-33	27.3-33	102	90	69,000	69	31	55	45	9/16	9/16		
120	20	20	574	143	130	75	347	33.5x33	33.5-31	102	91	85,500	66	34	54	46	9/16	9/16		
84	101 1/2	20	358	96	101	—	86x82	214	18.0-25	18.0-25	73	73	26,500	69	31	55	45			
118	14	27	423	134	117	—	102x114 1/2	261	24.0-25	24.0-25	80	85.5	46,100	66	34	53	47			
118	15	29	488	134	112	—	102x114 1/2	245	21.0-25	21.0-25	79.5	89.5	46,250	39	36	39.5	45			
124	15 1/2	22	546	139	105	—	120x122	277	14.0-25	24.0-25	79.5	90	56,000	41	33.5	42	44			
124	13 1/2	24	494	141	132	—	120x136	303	27.0-33	27.0-33	91	91	60,000	66	34	52	48			
124	15	22	564	141	123	—	136x123	303	27.0-33	27.0-33	98	91	68,000	43	36	40	48			
136	14	27	616 1/2	—	—	—	345	14.0-25	37.5-33	—	—	90,800	42	39	40	49	—	—		
1171/2	14	27	477	32	117	—	—	280	24.0-25	24.0-25	89.5	89.5	51,350	56	44	50	50	—	—	
124	13 1/2	261 1/2	545	141	132	—	136x120	312	27.0-33	27.0-33	91	91	80,000	55	45	48	52	—	3/4	
109	Unl.	19	408	132	107	49	108x58	233	26.5-25	26.5-25	75.3	87	40,865	65	35	56	44	1/2	1/2	
113	Unl.	21 1/4	472	138	122	61	114x77 1/8	279	29.5-29	29.5-29	80.2	91	54,345	65	35	56	44	9/16	9/16	
128	16	21	548	144	149	67	—	348	33.5-33	33.5-33	93.6	89.6	77,160	64	36	51	49	1/2	1/2	
128	16	21	595	144	149	67	—	348	27.0-33	27.0-33	90	89.6	60,190	37	38	48	48	1/2	1/2	
121	16	19	461	145	140	—	98x120	331 (g)	75° high x 30° wide	115	115	68,000	—	—	—	—	Electric Rock & Pinion	29		
121	16	19	938	145	162	—	98x120	714 (g)	75° high x 30° wide	115	115	136,000	—	—	—	—	Electric Rock & Pinion	30		
150	30	26	1,242	176	168	—	140x150	981 (g)	89° high x 40° wide	136	136	262,000	—	—	—	—	Electric Rock & Pinion	31		
84	24	FORCED POSITIVE	338	96	109	561 1/2	84x39	193	10.0-25	10.0-25	74.5	74.5	22,830	69	31	58	42	1/2	1/2	
84	24	FORCED POSITIVE	338	96	109	561 1/2	84x39	193	10.0-25	10.0-25	74.5	74.5	22,830	69	31	58	42	1/2	1/2	
114	18	FORCED POSITIVE	447	136	121	47	60x114	268	24.0-25	24.0-25	82	82	44,000	66	34	53	47	5/8	5/8	
114	21	FORCED POSITIVE	492	136	121	551 1/4	60x114	387	12.0-25	24.0-25	82	82	49,000	40	35	38	46	5/8	5/8	
120	20	FORCED POSITIVE	532	140	145	63	67x120	322	27.0-33	27.0-33	98	93	69,400	67	33	53	47	5/8	5/8	
132	20	17	716	154 1/2	168	71	132x150	431	12.0-20	29.5-29	88	88	108,130	50	50	45	55	—	—	
132	20	17	716	154 1/2	168	71	132x150	431	12.0-20	29.5-29	88	88	108,130	50	50	45	55	—	—	
132	20	17	736	154 1/2	168	83	132x150	443	29.5-25	37.5-33	88	88	110,130	50	50	45	55	—	—	
132	16	251/2	760	154 1/2	168	83	132x180	467	14.0-25	33.5-33	88 5/8	88	131,040	50	50	45	55	—	—	
132	16	251/2	762	154 1/2	168	94	132x160	470	14.0-25	33.5-33	92 5/8	88	139,880	50	50	45	55	—	—	
84	16 1/2	10	365	102	75	48	—	221	18.0-26	14.0-26	—	—	17,000	—	—	30	70	—	—	
84	8	14	ROLL OUT	189	95.5	83	42	84x76	188	18.0-26	11.25x28	57	71	16,300	75	25	60	40	—	—
84	8	14	ROLL OUT	189	95.5	83	42	84x76	188	18.0-26	11.25x28	57	71	16,300	75	25	60	40	—	—

Allis-Chalmers Mfg. Co., Construction Machinery Div., Milwaukee 1, Wis.

Caterpillar Tractor Co., Peoria, Ill.

Clark Equipment Co., Construction Machinery Div., Benton Harbor 21, Mich.

Curtiss-Wright Corp., South Bend Div., South Bend, Ind.

Euclid Div., General Motors Corp., Cleveland 17, Ohio

International-Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

R. G. LeTourneau Inc., Longview, Tex.

LeTourneau-Westinghouse Div., Westinghouse Air Brake Co., Peoria, Ill.

M-R-S Mfg. Corp., Flora, Ill.

Oliver Corp., 400 W. Madison St., Chicago, Ill.

Seaman-Gunnison, Milwaukee 18, Wis.

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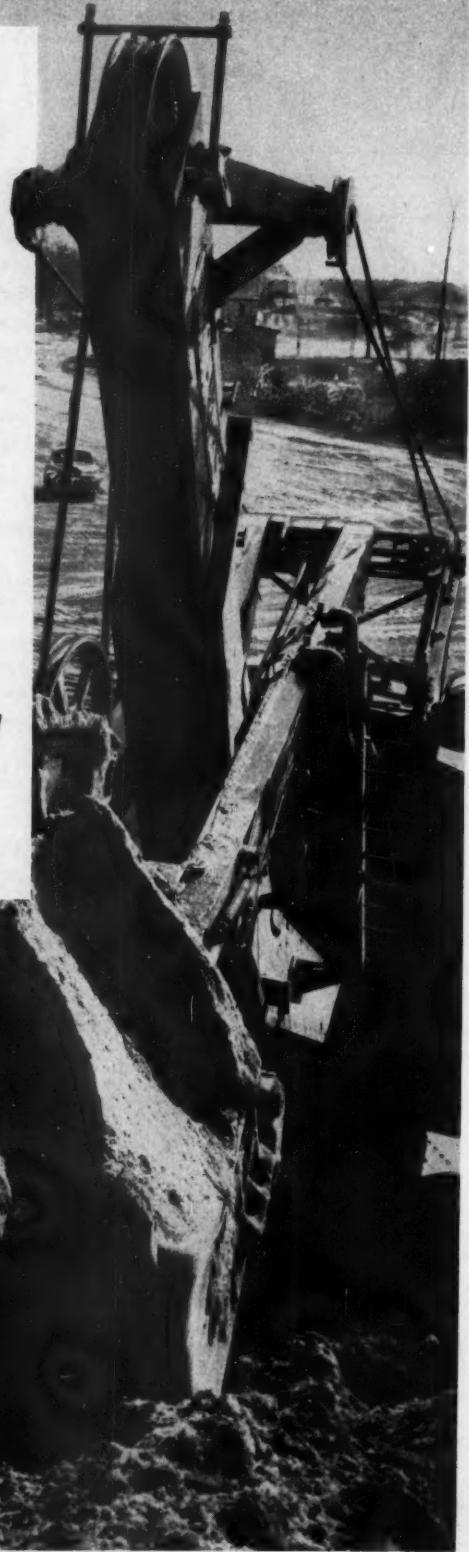
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TRACTOR—DRAWN SCRAPERS



MAKE AND MODEL		Recommended Tractor DHP	GENERAL DATA					PERFORMANCE DATA					DIMENSIONS, OVERALL															
			Stuck Capacity, Yds.	Hinged Capacity, Yds.	Capacity, Tons	Control, Type	Ejection, Type	Price, FOB, Factory	Width of Cut, In.	Depth of Cut, In.	Depth of Spread, In.	Apron Opening, In.	Width of Non-Slip Track, In.	Weight Distribution	Width, In.	Height, In.	Height of Sides, In.	Wheel Base, In.	Standard Tires, Front	Standard Tires, Rear	Gage, Front	Gage, Rear	Weight, Shipping					
ALLIS-CHALMERS	44	4	5.5	6.5	Hyd.	CABLE	POSITIVE FORCED	76 93 102 116	7.5	12.6	71	237	45	55	45	55	281	93	66	28 1/2 x 76	35	166 1/4	11.00-20	11.00-20	56	60	6,595	1
	106	6.1	8.5	10	Cable				9	16	78	243	45	55	45	55	303	113	82	35 x 93	38	168	14.00-20	14.00-20	53	74	10,300	2
	108	8.4	12	14	Cable				10	18	87 1/2	291	45	55	44	56	334	124	91 1/2	47 x 102	42	196 1/4	16.00-20	16.00-20	69	84	15,250	3
	315	15	20	25	Cable				12	24	102	337	45	55	45	55	406	138	110	49 x 116	62	232.5	21.00-24	21.00-24	76	88	26,475	4
ALLIED	KS-700	65-85	7	9	HYDRAULIC	POSITIVE	FORCED ROLL OUT	84 102 102 120 120	12	15	45	216					306	102	93	43 x 84	46	204	16.00-20	16.00-20	63	63	16,040	5
	KS-800	85-115	8.2	11					12	20	55	228					384	120	104	48 x 102	40	220	16.00-24	16.00-24	80	80	19,560	6
	KS-1000	100-135	10	13					12	20	55	228					384	120	104	48 x 102	50	220	16.00-24	16.00-24	80	80	20,650	7
	KS-1500	135-170	15	19					24	59	300						464	142	110	77 x 120	50	288	21.00-24	93	93	33,100	8	
	KS-1700	135-170	17	21					24	59	300						664	142	110	77 x 120	57	288	21.00-24	93	93	34,100	9	
BE-GE	ST-8590	50-70	6.7	9	CABLE	DOZER TYPE, POSITIVE	FORCED ROLL OUT	7,491 7,993 10,159 10,773	13	14	52	262	48	52	48	52	319	122	74	42 x 102	43	188	14.00-20	14.00-20	58	83	12,600	10
	ST-85105	50-70	8.2	10.5					14	52	262	47	53	47	53	319	122	74	42 x 102	49	188	14.00-20	14.00-20	58	83	13,000	11	
	ST-85120	60-95	8.5	11.7					11	16	58	286	48	52	48	52	354	123	86	48 x 102	46	233 1/2	16.00-25	16.00-25	66	80	15,900	12
	ST-85140	60-95	10.5	14					16	58	286	47	53	47	53	354	123	86	48 x 102	50	233 1/2	16.00-25	16.00-25	66	80	16,500	13	
CATERPILLAR	60	75	7	9	CABLE	DOZER TYPE, POSITIVE	FORCED ROLL OUT	94.8 112 124 130	11	13.5	54	264	45	55	40	60	338	112	93	40 x 92	47	201.8	14.00-21	16.00-21	62	71	13,500	14
	435	75-180	15	19					19	64	300	41	59	40	60	400	130	119	51 1/2 x 108	64	240.8	28.5-25	28.5-25	68	76	25,400	15	
	463	180-260	22	28					20	74	348	42	58	41	59	456	141	134	69 x 120	62	277.5	26.5-25	29.5-29	77	87	35,000	16	
	491	180-260	30	38					22	75	384	43	57	42	58	489	154	144	78 x 126	82	303	29.5-29	33.5-33	80	94	47,500	17	
CURTIS-WRIGHT	CWT-8	75	8	10.5	CABLE	POSITIVE	FORCED ROLL OUT	0,750 11,250 15,750 20,475 28,125 33,225	92	16	60	294	47	53	44	56	339	110	94	47	200	16.00-20	16.00-20	60	72	15,300	18	
	CWT-10	100	10	13.5					102	21	69	302	47	53	46	54	360	121	102	48	217	18.00-25	18.00-25	60	81	20,100	20	
	CWT-15	150	15	20					21	24	78	357	47	53	45	55	408	143	121	61	249	23.5-25	26.5-25	70	92	29,800	20	
	CWT-20	200+	20	27					22.5	79	378	47	53	45	55	435	143	121	65	268	26.5-25	29.5-25	80	92	39,500	21		
	CWT-26	190+	26	33					120	23.5	112	424	47	53	45	55	470	143	147	75	299	29.5-29	29.5-29	80	91	51,000	22	
	CWT-30	200+	30	39					120	20	110	433	47	53	45	55	490	144	146	78	315	29.5-29	33.5-33	80	91	55,400	23	
	INTERNATIONAL	45-55	101-125	10.3	14	CABLE	Positive Forward	Positive Roll Out	108 114	Not Limited	31	73	300	44	56	388	131	102	58 x 108	49	224	16.00-25	21.00-25	67.5	86	24,550	24	
	45-85	126-175	16	20	37				82.3	396	44	56	434	138	117	72 7/8 x 114	66	266	21.00-25	24.00-29	70	98.8	34,425	25				
LE TOURNEAU-WESTINGHOUSE	IT	150+	21	28	CABLE	POSITIVE FORWARD	FORCED ROLL OUT	120 114 120 114 100 132 132	20	20	80	442	49	51	43	57	482	140	128	60 x 120	63	311	29.5-29	29.5-29	96	94	39,830	26
	CE	12.2	18	20					16	73	312	—	—	—	—	—	399	136	116	60 x 114	47	311	16.00-20	21.00-25	66	82	26,300	27
	CLE	19.2	27	20					18	78	411	—	—	—	—	—	453	140	128	60 x 120	63	288	23.5-25	24.00-25	92	96	32,600	28
	CT	90+	14	20	22				20	72	328	47	53	43	57	395	136	126	59 x 114	47	253	18.00-25	26.5-25	83	83	25,350	29	
	DT	70+	8.3	11.5	14				20	60	310	45	55	46	54	347	123	100	40 x 102	45	201	16.00-20	16.00-20	66	80	15,750	30	
	M.R.S.	190HW	340	30	38.5	45	Hyd	HYDRAULIC EJECTION	17	95	468	50	50	45	55	492	154	168	132 x 150	71	300	29.5-29	37.5-33	84	101	64,000	31	
	200HC	340	47	55.5	40	Hyd	17		95	468	50	50	45	55	492	154	168	132 x 150	111	300	29.5-29	37.5-33	84	101	67,000	32		
	200HW	400	35	43.5	52.5	Hyd	16		25%	95	492	50	50	45	55	492	154	168	132 x 150	83	300	33.5-33	37.5-33	84	101	68,000	33	
	250HC	450	54	64	52	Hyd	16		25%	95	492	50	50	45	55	516	154	168	132 x 158	114	324	33.5-33	37.5-33	84	101	75,500	34	
	250HW-A	450	40	50	60	Hyd	16		25%	95	492	50	50	45	55	516	154	168	132 x 158	83	324	33.5-33	37.5-33	84	101	74,000	35	
	250HW-B	530	45	55	69	Hyd	16		25%	95	492	50	50	45	55	516	154	168	132 x 168	94	324	33.5-33	37.5-33	84	101	76,000	36	
OLIVER	ST-530	25-30	2.5	3.0	Pully Hyd.	HYDRAULIC EJECTION	FORCED ROLL OUT	60 72 84 102 102 102 102	7%	8	36	186	44	56	232	72	59	32	137	7.5-20	7.5-20	4,595	37					
	ST-645	35-40	3.6	4.5					8	11	40	207	44	56	259	84	64	36	153	9.0-20	9.0-20	6,000	38					
	ST-770	40-50	5.05	7.0					12%	11	42	228	44	56	277	100	71	40	168	11.00-20	11.00-20	7,950	39					
	ST-850	50-70	6.75	9.0					13	14	52	261	44	56	319	121	76	43	180	14.00-20	14.00-20	12,360	40					
	ST-85105	50-70	8.25	10.5					14	52	261	44	56	319	121	76	49	180	14.00-20	14.00-20	12,710	41						
	ST-85170	60-95	8.5	12.0					11	16	58	285	44	56	353	123	86	46	204	16.00-24	16.00-24	15,900	42					
	ST-85140	60-95	10.5	14.0					11	16	58	285	44	56	353	123	86	58	204	16.00-24	18.00-24	16,325	43					

* Specifications on New Models will be available in late 1960.

Allis-Chalmers Mfg. Co., Construction Machinery Div., Box 512, Milwaukee, Wis.
Allied Tractor Eng. Co., 2917 E. Marginal Way, Seattle 4, Wash.

American Tractor Equipment Co., San Leandro Blvd., Oakland, Calif.

Be-Ge Mfg. Co., Gilroy, Calif.

Caterpillar Tractor Co., Peoria, Ill.

Curtiss-Wright Corporation, South Bend Division, South Bend, Indiana
International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.

LeTourneau-Westinghouse Co., Ponca, Okla.

M.R.S. Mfg. Co., Flora, Miss.

Oliver Corp., 400 W. Madison St., Chicago, Ill.

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Col.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38						
27	JOY	RP125	125	2	(1)	2,000	6	125	100	1						Cont.	FA-12(4	50	—	—	—	20	12(6)	62	63	2,710	2,910	—	—	—	—	—	—	—	—	—	27						
28	RP250	250	2	(1)	1,750	9	125	100	1						Herc.	GD339	6	69	40	150	72	74	4,300	4,710	150	72	74	4,450	4,910	—	—	—	—	—	—	—	—	—	—	28			
29	RP365	365	2	(1)	1,750	13	125	100	1							GM	4-71	4	122	60	—	—	—	—	118	80	76	5,680	6,340	—	—	—	—	—	—	—	—	29					
30	RP500	500	2	(1)	1,750	16	125	100	1							GM	6-71	6	150	110	—	—	—	—	140	72	81	8,100	9,200	—	—	—	—	—	—	—	—	30					
31	RP800	900	2	(1)	1,800	22	125	100	1							Cumm. NHTO	6	300	150	—	—	—	—	150	86	86	10,700	12,260	—	—	—	—	—	—	—	—	31						
32	LeROI	125G1	125	Recip.	1	5 3/4 x 1 1/2	—	1,300	7	110	100	1	Water	8	LeROI	0226	4	41	—	—	—	15	114(6)	58	58	1,940	2,095	—	—	—	—	—	—	—	—	—	32						
33	125RG2	125	Ratio.	2	(1)	1,600	27	125	100	1	Oil	21	LeROI	0201	4	45	—	—	—	24	115(6)	60 1/2	64	2,200	2,500	—	—	—	—	—	—	—	—	—	33								
34	125Tractor ^(a)	125	Recip.	1	5 3/4 x 4 1/2	—	1,350	4	110	100	1	Water	7	LeROI	0226	4	42	—	—	—	17	127(6)	61 1/2	63	3,500	3,625	—	—	—	—	—	—	—	—	—	34							
35	365R02	365	Ratio.	2	(1)	1,100	5.5	125	100	1	Oil	80	—	—	—	GM	4-71	4	110	54	—	—	—	—	125	86	80	7,010	7,640	—	—	—	—	—	—	—	—	35					
36	600R02	600	Ratio.	2	(1)	1,800	15	125	100	1	Oil	120	—	—	—	GM	6-71	6	156	82	—	—	—	—	150	90	80	7,730	8,740	—	—	—	—	—	—	—	—	36					
37	1200R02	1200	Ratio.	2	(2)	1,800	24	125	100	2	Oil	240	—	—	—	GM	6-71	6	392	160	—	—	—	—	174	96	96	14,700	16,615	—	—	—	—	—	—	—	—	37					
38	SCHRAMM	P-25	125	PROACTING ^(b)	1	4 1/2 x 4 3/4	—	1,370	3.0	200	100	1	Water	9	Schramm	CD1H	3	41	16	115(6)	58	58	2,270	2,445	115	58	57	2,370	2,545	—	—	—	—	—	—	—	—	38					
39	U-250	225	1	4 1/2 x 4 3/4	—	1,350	7	200	100	2	Water	9	Schramm	GND	6	85	HIC	UD-IA	4	88	35.5	129	65	67	4,700	4,815	127	65	67	5,700	6,150	—	—	—	—	—	—	—	—	39			
40	U-315	315	1	5 x 6 ^(c)	—	1,180	11	200	100	2	Oil	15	—	—	—	HIC	UD-IA	6	116	48	—	—	—	—	150	71	70	8,600	9,280	—	—	—	—	—	—	—	—	40					
41	U-600-TC ^(d)	600	1	5 5/8 x 6 ^(e)	—	1,200	19	200	100	1	Oil	15	—	—	—	HIC	UD-T	6	125	85	—	—	—	—	194	82	69	12,200	13,250	—	—	—	—	—	—	—	—	41					
42	GORDON SMITH ^(f)	125	Ratio.	1	4 5/8 x 5 1/4	—	1,500	4.5	150	100	1	Oil	21	Ratio	WATER	5	Herc.	RXC	3	57	—	—	—	20	119(6)	62	65	2,100	2,150	—	—	—	—	—	—	—	—	42					
43	WORINGTON	125	Ratio.	2	(1)	1,800	2.5	125	100	1	Oil	21	Ratio	WATER	5	Herc.	JX40	4	53.5	Herc.	DI136	4	57	20	127	62	54	2,750	2,944	127	62	54	2,900	3,116	—	—	—	—	—	—	—	—	43
44	210	210	2	(1)	1,800	5.8	125	100	1	Oil	60	—	—	—	Herc.	M330	6	78	GM	4-51	4	61	35	110	66	62	4,550	4,671	110	66	60	4,725	5,092	—	—	—	—	—	—	—	—	44	
45	315	315	2	(1)	1,800	10	125	100	1	Oil	68	—	—	—	Herc.	3-71	3	94	50	—	—	—	—	129	84	72	6,330	6,814	—	—	—	—	—	—	—	—	45						
46	365	365	2	(1)	1,800	10	125	100	1	Oil	68	—	—	—	Herc.	HH-400	6	120	50	—	—	—	—	129	84	77	1,140	1,625	—	—	—	—	—	—	—	—	46						
47	600	600	2	(1)	1,800	14.5	125	100	1	Oil	180	—	—	—	Herc.	6-71	6	160	100	—	—	—	—	154	93	92	8,800	9,738	—	—	—	—	—	—	—	—	47						
48	900	900	2	(1)	1,800	21.6	125	100	1	Oil	180	—	—	—	Herc.	NHTO	6	300	160	—	—	—	—	177	165	82	12,250	13,800	—	—	—	—	—	—	—	—	48						

All specificities at Sea Level.

(a) Dimensions on Two Wheel Trailer

(b) Multi-stage

(c) Tractor-compressor combination

(d) Piston type supercharged with Rotary

(e) Available with 64-in. track

(f) with 120 HP Cummins NHC 40-81

(g) " "

" Cummins NH-220-81

ALLIS-CHALMERS Model D Grader

Popularity traced to rugged features
including transmission by Clark

If you're in the earthmoving business, you undoubtedly know the Allis-Chalmers Model D motor grader. Compact, maneuverable, inexpensive, the 58 hp Model D is one of the most popular small motor graders on the market today. There are many reasons for its success—one of the more important, we're told (and happily repeat), is its transmission.

For the transmission in this grader is built by Clark.

Like all Clark transmissions, this unit represents 57 years of experience in the automotive product business. It provides four speeds forward (2.7 to 25.2 mph) and one reverse (3.3 mph). Shafts are short, strong, light in weight. Gears themselves bridge the vertical distance between engine and axle drive. And because the gear shift lever is a part of this Clark transmission, all control linkages are eliminated. So you get more efficiency, have less trouble and less maintenance.

Operate the job-proven Model D motor grader and see for yourself.

Or, if you'd like to know more about the advantages of a Clark transmission as applied to your truck, tractor or other vehicle write us. We'll be glad to send you literature showing the complete Clark transmission line.



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EQUIPMENT**

CLARK EQUIPMENT COMPANY
AUTOMOTIVE DIVISION
Jackson 6, Michigan

Construction Men in the News . . .

Spencer, White & Prentis



EDWARD E. WHITE is the new president of Spencer, White & Prentis, succeeding JOSEPH C. WEAVER, who becomes chairman of the board. In another executive promotion, ROBERT E. WHITE becomes executive vice president of the New York City heavy construction firm, which specializes in foundations and underpinning and has been joint venturer in other types of projects.

Edward E. White has been with the company since 1933. The son of Lazarus White, a founder of the firm, he has participated in the construction of the Sixth Ave. Subway in New York City, locks and dams on the Mississippi River, and the Norfolk Navy Yard's Dry Dock No. 8 in Portsmouth, Va.

Weaver, who has been president since 1955, joined the firm in 1922. During his presidency, the company expanded its operations into Canada and opened offices in other United States cities in addition to its headquarters in New York.

Robert E. White joined the firm in 1934. He has participated in many projects, including the underpinning of the White House and the construction of tankers in Mobile, Ala., during World War II.

Kaiser

GEORGE HAVAS is the newly appointed vice president and director of engineering for Kaiser Industries Corp.

Havas has been associated with various Kaiser companies since 1928 when he joined Kaiser Paving Co. as an engineer on a highway project in Cuba. He became chief engineer of Henry J. Kaiser Co. in 1935 and vice president in 1945.

From 1945 until 1958, Havas was responsible for all Kaiser engineering and construction projects in the United States and overseas. In 1958, he assumed the position of general manager of the company's Heavy Construction Division and international subsidiaries.

During his career, he has participated in many prominent projects, including the construction of Hoover and Bonneville Dams.

JOHN HALLETT is the new general manager of Kaiser Engineers International, formerly known as the Heavy Construction Division of Henry J. Kaiser Co. A vice president, and previously assistant general manager, Hallett will be responsible for all engineering and construction activities outside the United States and Canada.

Hallett joined Kaiser in 1938 as an engineer and worked on heavy construction projects, including Grand Coulee Dam. He participated in the management of the firm's shipbuilding program during World War II, then became executive vice president and general manager of Kaiser Motors, Inc., and vice president of Kaiser Metal Products.

Vermilya-Brown

Two executive changes have been announced by Vermilya-Brown Co., Inc., 106-year-old New York City construction firm.

EARL H. NOREM, executive vice president and treasurer, becomes chairman of the board.

FRANK C. SCHMITT, for the past 14 years associated with Raymond Concrete Pile Co., becomes executive vice president.

Norem has been associated with

the firm continuously since 1911. During World War II, he was construction consultant to the War Production Board.

Schmitt has 40 years of experience in public and private projects in many parts of the world. Recently, he participated in the construction of 16 buildings for Brasilia, the new capital of Brazil, and other projects in Colombia, Turkey, Liberia, Iran, and parts of Central America.

Perini

THREE EXECUTIVES of Perini Corp. have been promoted. HUGH F. DOHERTY is a newly elected vice president and director of purchasing. LOUIS R. PERINI, JR., is the new vice president for western operations, and LOUIS O. KELSO, is the new secretary of the firm.

Doherty joined Perini in 1932, becoming secretary of the corporation in 1942. He has played a principal role in the preparation of every estimate submitted by Perini in the past 20 years.

In his new position, Lou Perini, Jr., will be the senior executive for all Perini activities in the Pacific area. From 1948 to 1957, he was a partner in his own construction firm. Then, after a year of construction and mining experience in Canada, he joined Perini's building division in 1958. For the past year he has been assistant to the president.

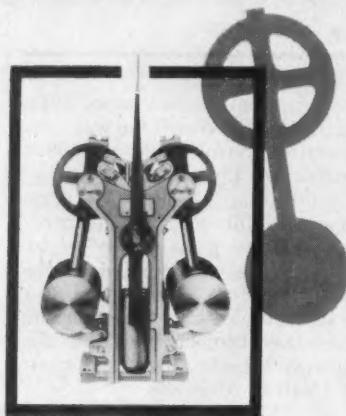
Kelso, a specialist in corporate and financial law, is a senior partner of the San Francisco law firm of Kelso, Schnacke, Lerer, Cotton & Holmes.

MC&S

NORMAN W. EASTWOOD, a veteran of more than 30 years in the construction business, is the newly elected vice president of the Construction Department of Merritt-Chapman & Scott Corp.

Eastwood, previously construction manager, joined MC&S in 1945. He has served as field engineer, general superintendent, and project manager on a variety of heavy construction projects. Recently, he has participated in the construction of missile detection and defense bases, industrial plants, and office buildings.

HEAVYWEIGHTS!



DETECTO PENDULUMS

are the heaviest in the industry. This means longer, more accurate scale life.

Write for information on full line of industrial weighing equipment from 1/100 oz. to 100 ton:

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LESCHE WIRE **PORTER** ROPE DIVISION

H. K. PORTER COMPANY, INC.

Circle 253 on Reader Service Card

180

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distribution, sales personnel and other activities.

Distributor Appointments

Koehring Co.: The Kwik-Mix division has appointed Waco Scaffold & Equipment Co. of Portland, Ore., and Reily Equipment Corp. of Woodside, L. I., N. Y., as distributors. The C. S. Johnson division has appointed Pelican Machinery Co. of Bossier City, La., as distributor for northern Louisiana. The Parsons division has appointed the following distributors: Construction Equipment Co. of Detroit, Mich.; O'Neil Equipment Co. of Muskegon Heights, Mich.; and The Associated Supply Co. of El Paso, Tex.

Quick-Way Shovel Co.: The following distributors have been appointed: Frost Machinery Co. of Winnipeg, Man., Canada; and R. B. Everett and Co. of Houston, Tex.

Worthington Corp.: The following distributors have been appointed: Hasper Equipment Co. of Muskegon, Mich.; Buckhorn Equipment Co. of Cheyenne, Wyo.; Ensminger and Co., Inc., of Wilkes-Barre, Pa.; Southwood Machinery Sales, of Greenwood, Ind.; and Adams Machinery Inc. of Milwaukee, Wis.

Richmond Screw Anchor Co.: Richmond has been appointed distributor for Columbia-matic "8" Stud Fasteners. It will handle the distribution through its plants in Atlanta, Ga., Fort Worth, Tex., and St. Joseph, Mo.

American Biltrite Rubber Co.: The Boston Woven Hose & Rubber Division has appointed Sutton-Clark Supply, Inc., of Richmond, Va., as distributor.

Schramm, Inc.: The following distributors have been appointed: Dal-Tex Equipment Co. of Dallas, Tex.; Esch Brothers Implement Co. of Milwaukee, Wis.;

continued on page 184

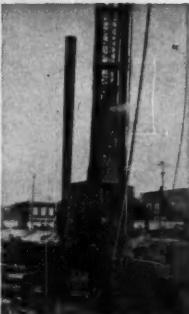
"GJ-BOSS"



GROUND-JOINT FEMALE COUPLING, STYLE X-34

SO Reliable FOR PILE DRIVING

...AND ANY
STEAM, AIR,
WATER AND
HYDRAULIC
SERVICES...
HIGH OR LOW
PRESSURE



Washerless

Unequalled for safety, efficiency and long service life. Ground-joint union between stem and spud provides leak-proof, trouble-free seal...no lost or worn-out washers to replace. All parts malleable iron or steel, rustproofed. Furnished with superstrong "Boss" Offset and Interlocking Clamps. Sizes $\frac{1}{4}$ " to 6", inclusive.

COMPANION MALE COUPLING

"BOSS" STYLE MX-16



Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Each size fits same size hose...oversize hose not required. Furnished with "Boss" Offset and Interlocking Clamp. Sizes $\frac{1}{4}$ " to 6", inclusive.

"BOSS" HOSE MENDER, STYLE BM-16



The practical, safe way to restore damaged hose to service. Fitting consists of corrugated mender tube and two "Boss" Interlocking Clamps. Tube has flanges to engage clamp fingers. Thoroughly rustproofed. Sizes $\frac{1}{2}$ " to 6"

Stocked by Manufacturers and Distributors of Industrial Rubber Products

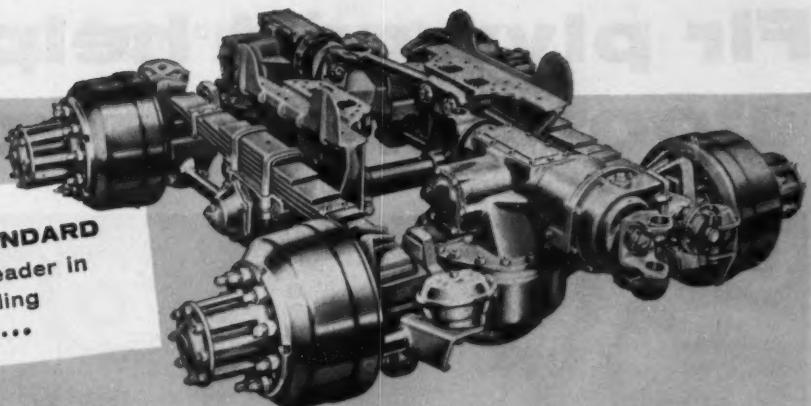
DIXON Valve & Coupling Co.

GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO • BIRMINGHAM • LOS ANGELES • HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO. Associate Companies
Mark Two Industries Inc., Quarryville, Pa. • Precision Drawn Steel Company, Camden, N.J.

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CONSTRUCTION METHODS

ROCKWELL-STANDARD
Acknowledged Leader in
Rugged Hauling
Operations...



Here's why Timken-Detroit®

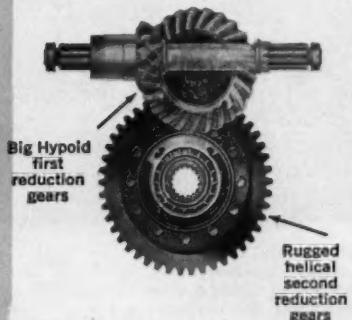
DOUBLE-REDUCTION TANDEMS LEAD IN TOP PERFORMANCE—LONG LIFE!

Timken-Detroit Heavy-Duty Tandems with Hypoid Helical Double-Reduction Gears are the big favorites for top performance and long life.

Here are some of the reasons why:

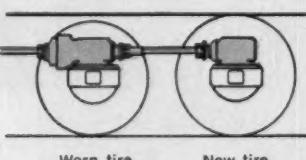
Rugged Hypoid-Helical Double-Reduction Gearing!

Balanced gearing—with two full-sized gear sets working in series to take an equal share of the load—provides a stronger power train with balanced gear set loadings and the widest range of ratios.



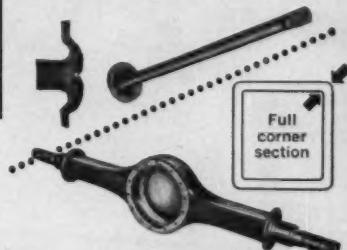
Driver Controlled Interaxle Differential!

Allows differential action between the axles to compensate for worn or mismatched tires. Both axles do equal amounts of work . . . can be disengaged at any speed, giving positive through drive when better traction is needed. *Straight-Line Through Drive* eliminates prop shaft angularity . . . increases bearing and gear life, reduces maintenance.



"Torsion-Flow" Axle Shafts and Hot-Forged Housings!

More splines, Torsion-Flow forging, and patented heat-treating processes make Rockwell-Standard shafts the toughest in the industry. Housings are hot-forged from high carbon steel, and are rectangular shaped with full strength corners for greatest strength with minimum weight.



Timken-Detroit Double-Reduction Tandems come in a wide range of capacities—6 models from 34,000 to 65,000 pounds.

Another Product of...

ROCKWELL-STANDARD
CORPORATION



Transmission and Axle Division, Detroit 32, Michigan

Fir plywood helps solve problem on giant



SCIOTO DOWNS RACE TRACK

LOCATION: Columbus, Ohio

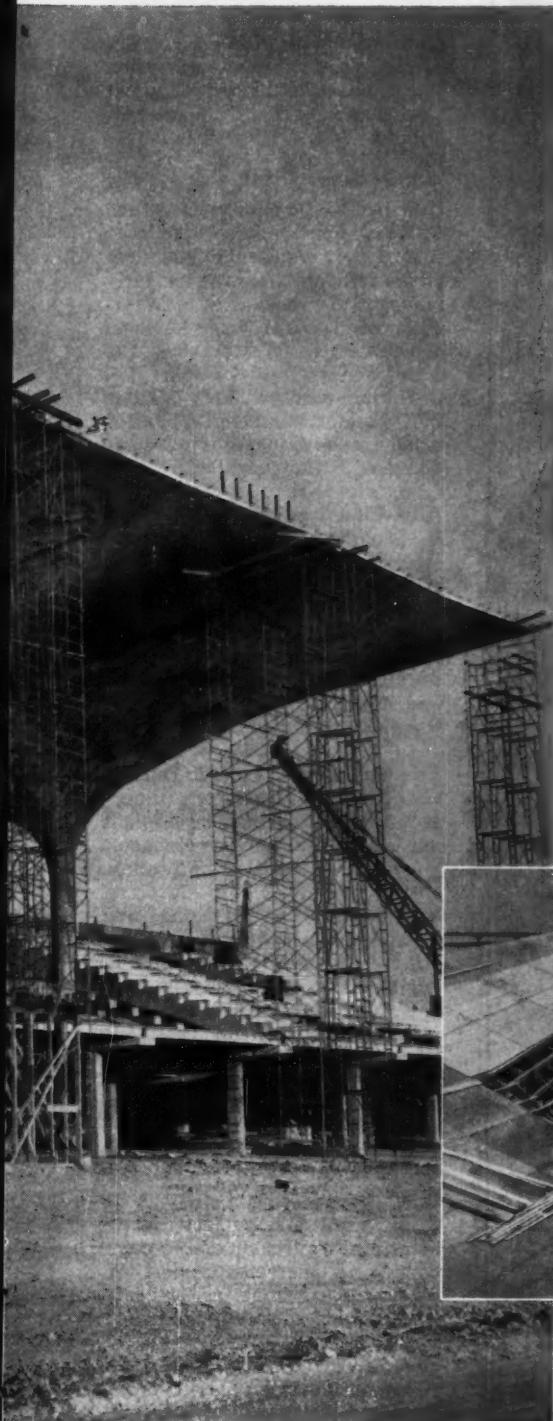
ARCHITECTS: Kelam & Foley, Columbus

STRUCTURAL ENGINEERS:

Gensert, Williams & Associates, Cleveland

CONTRACTOR: Sheaf Construction Co., Columbus

complex forming concrete umbrella roofs



PLYWOOD'S UNIQUE ADAPTABILITY as concrete form material simplified a complicated roof construction job at the Scioto Downs race track, Columbus, Ohio. At the same time, plywood created smooth concrete surfaces and kept costs low.

The striking grandstand roof is a series of huge hyperbolic-paraboloid concrete shells. Each 61 x 116-ft. section is supported by a 44-ft. column. The clubhouse and offices have thin-shell concrete folded plate roofs.

Plywood was shaped so easily to the complex curvatures of the grandstand roof, and made such tight joints, that the contractors found it needed no liner. Original specifications had been for lumber or plywood backing faced with hardboard for surface smoothness. But a single layer of $\frac{3}{4}$ " plywood to do both jobs resulted in a smooth, fin-free concrete surface, besides eliminating the labor and material cost of applying liner.

More savings came from plywood's ease of handling, which the contractors called a real cost cutter. And rate of re-use was exceptionally high. Panels stripped from the grandstand roof were used on the folded plates and were still good for many more times. There was only a four percent loss out of 10,000 sq. ft. of plywood.

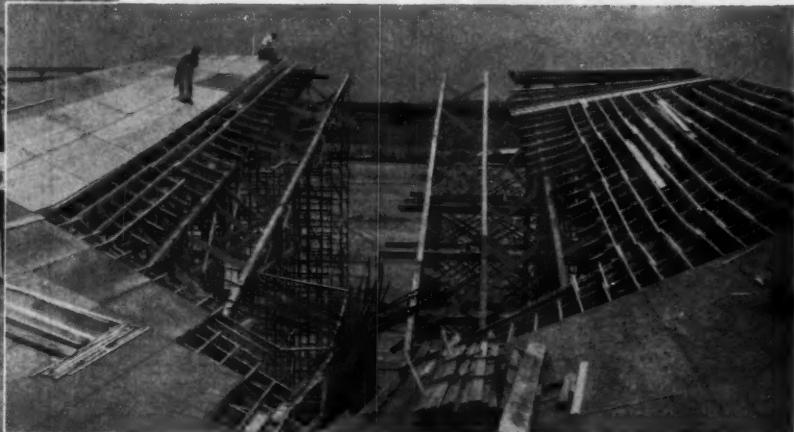
DOUGLAS FIR PLYWOOD ASSOCIATION

TACOMA 2, WASHINGTON

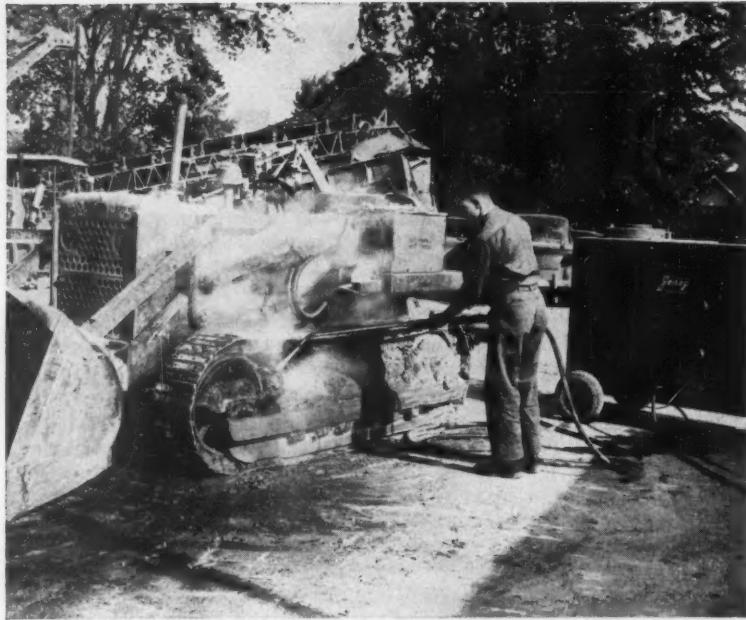
—a non-profit industry organization devoted to research, promotion and quality control



ALWAYS SPECIFY DFPA-QUALITY TRADEMARKED PLYWOOD. Concrete form grades include: **INTERIOR PLYFORM®**—made with moisture-resistant glue, gives up to 10-12 re-uses; **EXTERIOR PLYFORM®**—waterproof glue, gives up to 25 or more re-uses; **OVERLAID EXTERIOR PLYWOOD**—premium panel, forms smoothest concrete, gives up to 200 re-uses.



Grandstand roof forms were of $\frac{3}{4}$ " fir plywood over a grid of 2x4's and 2x6's. Panels adapted readily to required curves, yet joints were tight and final concrete surface was smooth and even. Office building behind grandstand and clubhouse at side have continuous folded plate concrete roofs. They were formed against plywood panels previously used on grandstand roof.



"Our '3500' Jenny® cuts cleaning costs 60%... maybe more!"

SAYS RALPH BROSHEARS, PARTS AND SERVICE MGR.,
FLESCH-MILLER TRACTOR CO., INDIANAPOLIS, IND.

Experienced in the business of servicing and selling heavy earthmoving machinery, Mr. Broshears tells us, "Our '3500' Jenny is in use six hours out of eight, five days a week. It cleans six times faster than our old steam cleaner and does a better job!"

You can perform eleven different cleaning actions—hot or cold—with one single adjustment lever . . . you always get the right pressure and gallonage for cleaning perfection. For any heavy-duty on, or off-the-road equipment, it's easy to remove packed and caked earth with the new "3500" Hypersure Jenny Steam Cleaner. Send in this coupon now for all the facts.



HOMESTEAD VALVE MANUFACTURING COMPANY

Hypersure Jenny Division — Coraopolis, Pa. (In Canada: Hypersure Jenny Sales & Service, Ltd., 517 Jarvis St., Toronto 5, Ont. C.S.A. Approved.)

Please send me full details on the new "3500" Jenny.

104

Name..... Title.....

Company.....

Address.....

City..... Zone..... State.....

Circle 184 on Reader Service Card

SALES AND SERVICE . . .

continued from page 180

Towanda Equipment & Leasing, Inc. of Towanda, Ill.; and Ogden Equipment Co. of Jacksonville, Fla.

McKiernan-Terry Corp.: The Construction Equipment Division has appointed Central Equipment Co., of Minneapolis, Minn., as distributors.

On the Sales Front

Hercules Galion Products, Inc.: C. I. Bohmer has been appointed construction equipment manager of the company. He was formerly manager of mixer sales of Westinghouse Transit Mixer Division of LeTourneau-Westinghouse Co.

R. H. Sheppard Co., Inc.: William P. O'Connor has been appointed district sales manager with headquarters in Hanover, Pa.

Allis-Chalmers Mfg. Co.: Charles D. Moore has been appointed sales manager, Construction Machinery Division, in Minneapolis. He formerly held the same position in St. Louis. He succeeds G. P. Molzahn, who has joined the sales staff of Mooney Tractor and Equipment Corp., the Allis-Chalmers dealer in Milwaukee.

Erie Strayer Co.: George Duncan is the new Southeastern representative for the concrete plant and clamshell bucket divisions. His territory consists of Tennessee, North and South Carolina, Georgia, Florida, Alabama, and Mississippi.

Joy Mfg. Co.: Stephen Laskevich, Jr., has been appointed district manager in Knoxville, Tenn. His territory consists of Kentucky, Tennessee, Virginia, North Carolina, South Carolina, Georgia, Mississippi, and Florida.

In the Main Office

Buell Engineering Co.: Jack L. Schumann has been elected president and a director of the company. He succeeds Gilbert W. who will continue as a board member and consultant.

Yale & Towne Mfg. Co.: Gordon Patterson has been elected president and a director of the company. He succeeds Gilbert W. Chapman, who retired. Mr. Pat-

terson previously was president of the Square D Company.

Massey-Ferguson Industrial Division: Two new directors have been appointed. They are John H. Shiner, marketing vice-president, and Harold A. Wallace, manufacturing vice-president.

Parsons Co.: J. W. Arnold has been appointed president and general manager of the company. Parsons is a division of the Koehring Co.

J. I. Case Co.: Carl von Linsowe has been appointed director of engineering-industrial products for the company.

Associations

Calcium Chloride Institute: William E. Dickerson, executive vice president and chief engineer of the institute, has been elected president. He replaces George H. Kimber, who has been president since 1946. Mr. Kimber remains with the institute as chairman of the board.

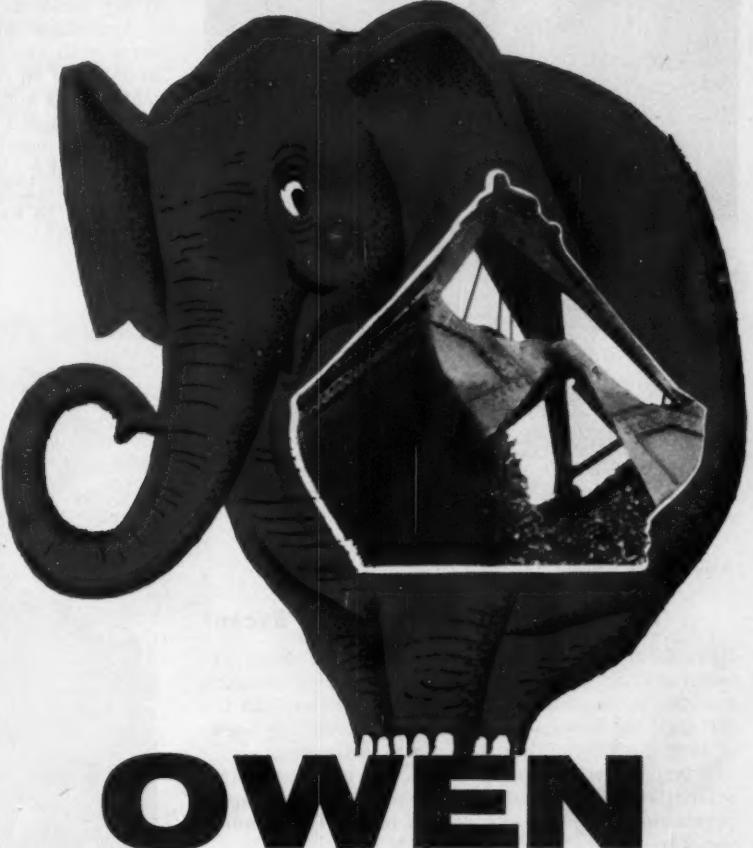
Portland Cement Association: The following changes in field personnel have been announced: Homer A. Humphrey has been appointed district engineer of the Southern New England District, with headquarters in Boston; Robert H. Lochow has been appointed district engineer for New Jersey with headquarters at Trenton, and Charles H. Knight, Jr., succeeds Mr. Lochow as district engineer for the states of Washington, Oregon, and northern Idaho, with offices in Seattle.

Special Mention

Associated Equipment Distributors: A repeat performance of last year's series of management conferences for distributor executives will be held this fall. Locations and dates for the sessions are as follows: the Drake Hotel in Chicago from Sept. 22-24; The Peabody Hotel in Memphis from Sept. 25-27; Sun Valley Lodge in Sun Valley, Idaho, from Oct. 5-7; and the Warwick Hotel in Philadelphia from Oct. 9-11.

Chain Belt Co.: The main office of Rex-Spanall, Inc., will be moved from New York City to Milwaukee. Rex-Spanall is a subsidiary of Chain Belt Co. organized last year to market Rex-Spanall horizontal shoring equipment in the United States.

BIG
in QUALITY and ECONOMY



OWEN clamshells are constructed with increased power and more durability foremost in mind. One of these features is the recessing of the top of each lip to receive the bowl plates. This gives the bucket a smooth interior and also relieves all stress and shear on the rivets that join the lips to the bowl plates. **Recessed lips are standard on all OWEN buckets—and at no additional cost!**

This is just one of the many reasons why OWEN Buckets are guaranteed pound for pound—size for size—to get a bigger load each bite—a larger output each day.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.



The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

Circle 185 on Reader Service Card

Construction Equipment News . . .

For more information on any item, circle the key number, found at the end of each item, on the READER SERVICE CARD just inside the back cover.



Hydraulic Power Loads the Bucket

Heavy duty hydraulic cylinders on this loader attachment do the work while the tractor remains stationary. Instead of ramming the tractor into the dirt pile, the Power-Crowd feature pushes the bucket into the pile, filling it to its $\frac{3}{4}$ -yd capacity.

International 340 and 460 tractors can mount this attachment. It is furnished complete with a tractor reversing kit and counterweight box.—A. C. Anderson, Inc., Dept. 216, Wildwood, N.J.

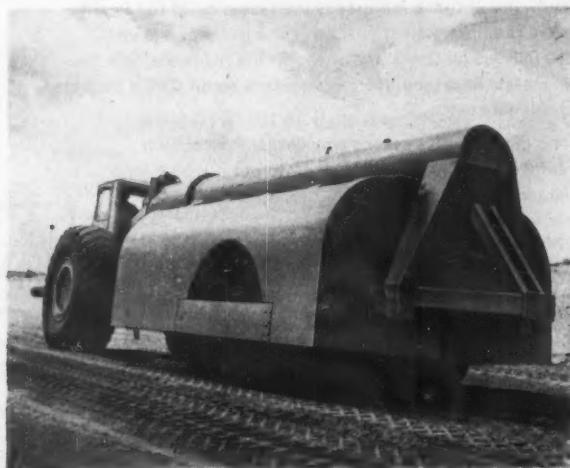
Circle 302 on Reader Service Card

Gun Installs Spray-On Roofing

One nozzle of the Flintkote Sealzit spray gun applies glass fibers, while two other nozzles apply special emulsions; the result is a monolithic film that serves as a roofing material. The Monoform roof system also can be applied on walls and pipes, or it can serve as insulation or waterproofing.

According to the manufacturer, a three-man crew with one spray gun can install between 15,000 and 18,000 sq ft of roofing material in one day. In addition to applying roofing materials, the gun can spray crushed rock, vermiculite, sand, roofing granules, metallic powders, and decorative flakes. A pump and a compressor supply the coating materials through hoses to the spray gun.—The Flintkote Co., 30 Rockefeller Plaza, New York 20, N.Y.

Circle 301 on Reader Service Card



Roller Weighs 50 Tons

Fully ballasted, the Ko-Cal Konsolidator weighs 115,000 lb. The two-wheel tractor accounts for 15,000 lb, and the four-wheel roller carries the rest. Empty weight is 37,000 lb. The roller's body carries 700 cu ft of sand ballast, while the towing frame holds 130 cu ft of water.

The roller is 20 ft long, 12 ft wide, and 10 ft high. It rides on 20-ply, 18.00x25 tires. Top operating speed is 10 mph.—Koehring Co. of California, P. O. Box 1891, Stockton, Calif.

Circle 303 on Reader Service Card



Suction Dredge Is Easy to Transport

Removing the two front pontoons of this dredge reduces its size sufficiently for trucking over the highway. It takes only one day to reassemble it for operation.

All dredging operations are remote controlled from the cabin. The 8-in. dredge is equipped with a hydraulic drive and can dig to a depth of 50 ft.—**American Marine and Machinery Co., Inc., P. O. Box 1150, Nashville, Tenn.**

Circle 304 on Reader Service Card



Depth Marker Holds Trench Grade

Hydraulic power raises and lowers the boom on the L-12 Trench Devil. And a depth marker resets the boom at the desired depth after it is raised to clear obstructions.

Digging speeds are variable up to 1,200 ft per hr. When not digging, maximum travel speed is 2 1/2 mph in either direction. An air-cooled, 12 1/2-hp Wisconsin engine powers the 1,460-lb rig. Maximum digging depth is 5 1/2 ft, widths range from 4 to 14 in. A belt conveyor carries the spoil to either side of the trench. The conveyor can be switched from one side of the trencher to the other in just 60 sec.—**Arps Corp., New Holstein, Wis.**

Circle 305 on Reader Service Card

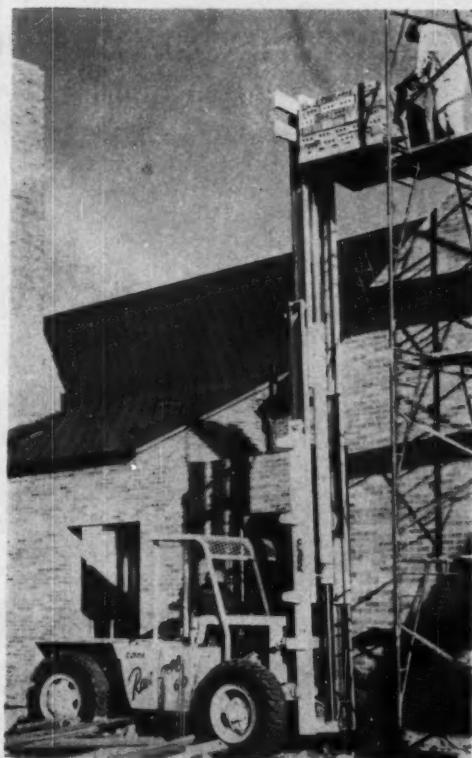


Bridge Crane Rides on Rubber Tires

Four rubber-tired wheels support a 25-ton bridge crane that is wide enough to service four trucks at the same time. An outstanding feature is the crane's maneuverability because the front wheels can be steered through a system of linkages actuated by hydraulic cylinders.

Hydraulic motors and cylinders also perform all other operating functions; power comes from a 60-hp gasoline engine. The steerable front wheels are the drive wheels. Each is powered by a reversible hydraulic motor through a chain driven Cone-Drive speed reducer. The motors are mounted on brackets attached to the wheel axle supports. Hydraulic pump-speed reducer combinations also operate the hoist and move the hoist carriage across the bridge.—**Travelift & Engineering, Inc., Sturgeon Bay, Wis.**

Circle 306 on Reader Service Card



Fork Lift Gives Extra-High Reach

Triple-stage uprights for the Ranger 60 fork truck extend its reach to heights from 126 to 216 in. Overall height of the unit with the forks lowered ranges from 79 1/2 to 111 1/2 in., with forks raised it is 157 to 247 in. Higher fork heights are available on special order.—**Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.**

Circle 307 on Reader Service Card

Better products, *faster*, from your Federal-Mogul jobber:



Federal-Mogul Sintered Engine Bearings... research developed for heavy-duty service



Fm heavy-duty engine bearings are quality engineered to save you time on replacements . . . boost your profits on the job

Construction equipment needs fast service to get back on the job, and dependable parts to stay there longer. You get *both* with Fm engine bearings. Rebuild work goes faster because you get speedy delivery on the specific type and size bearings needed to repower your engine.

The exclusive 5-layer design of Fm engine bearings is engineered for heavy-duty service. They're the finest bearings on the market today!

Federal-Mogul makes heavy-duty engine bearings for all types of equipment. Call your Federal-Mogul jobber for fast delivery.

FEDERAL-MOGUL ENGINE BEARINGS

FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN



EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.



Boom Length Adjusts To Fit Job Conditions

The Burg Super hoe allows an operator to select the best boom length for his particular job. Minimum boom length is 10 ft; it can be increased in any increments to a maximum of 23 ft. At a 20-ft depth the $\frac{3}{4}$ -yd hoe can dig a level area 10 ft long.—Burg Mfg. Co., Waverly, Neb.

Circle 308 on Reader Service Card



Mixer Places Roof-Deck Concrete

This rig discharges mixed concrete through a hose in heights up to 20 ft and over horizontal distances of 250 ft. The rig's mixer and its Moyno pump are each driven by a separate Wisconsin engine. A Neptune Auto-Stop meter controls the water.

The bucket lift and bucket door as well as the discharge gate are hydraulically operated. Controls are located within easy reach of an operator's platform.—Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 39, Mo.

Circle 309 on Reader Service Card

BUILT-IN RUST PROTECTION

Blue Brute Air Tools give you a big money-saving feature—they resist rust and corrosion. The reason is an exclusive process: Blu-Coated Parts. With Blu-Coated Parts Worthington Air Tools operate better job after job and in damp atmosphere. They resist wear, seizing, galling. They hold oil better. Even after your toughest jobs you can store them for months without deterioration.

Blu-Coated and Worthington Distributor's Guaranteed Availability Plan keep your jobs going even if your tools are in for checkup or repair. GAP works this way: 1) bring in your Blue Brute tool for repair. While it's in distributor's hands he will, 2) lend you an air tool to keep your job going. See him for complete details, about Blu-Coated, GAP, and assured parts and replacements. 60-15



Circle 251 on Reader Service Card



Neenah Foundry Company Plant No. 2, in production now

Neenah Announces.....

the full-time operation of plant No. 2. The production from this 150,000 square feet facility

increases our daily maximum capacity to 500 tons of Gray Iron and Ductile Iron CASTINGS.



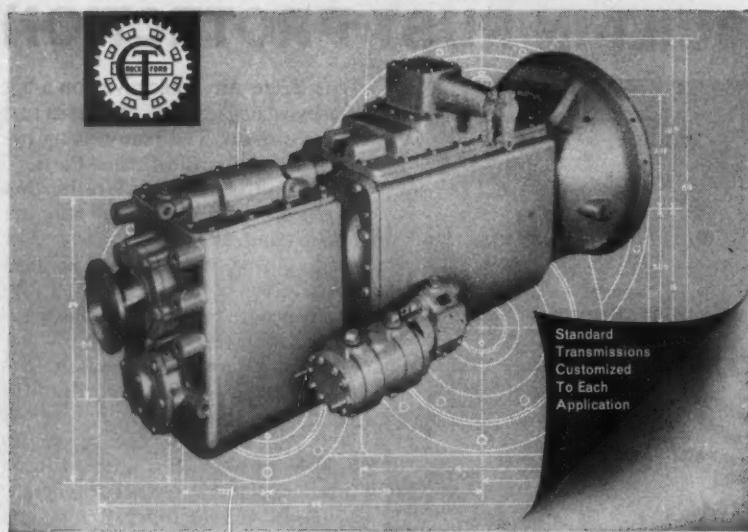
Informative and fully illustrated 168-page catalog will be sent promptly upon request.

NEENAH FOUNDRY COMPANY

NEENAH • WISCONSIN

Chicago Office: 5445 North Neva Avenue, Chicago 31, Illinois

Circle 189 on Reader Service Card



Heavy-Duty Multiple-Speed Transmission

Cotta heavy-duty transmissions match high-speed engines to big-machine production

Balancing 2300 - 2400 rpm engines for best heavy equipment production is all in a day's work for Cotta heavy-duty transmissions. Why? Because Cotta transmissions are especially engineered to handle the severe shock loads common in today's big-machine operations.

Extra-wide gears absorb 150 - 2500 ft-lb input torque loads of drilling rigs, power shovels, rock crushers, and mining equipment. Large, multiple-spline connections on alloy steel shafts eliminate stress points and provide maximum concentricity of gears.

±.0005" tolerances aid efficiency

At least 400 to 500 inspections of each gearbox help maintain tolerances to $\pm .0005"$. That accuracy won't wear off — even after long, tough use! Closely spaced gear ratios provide the variable speeds required on vigorous big-machine production. And, hand assembly of all Cotta transmissions provides the dependability and efficient performance that pumps, generators, locomotives, off-highway trucks, and similar equipment demand for long hours of trouble-free operation in the field.

Diagrams sent free on request

See our Catalog No. 3a /Co in *Sweet's Product Design File*. Check the detailed descriptions and specifications on standard and custom applications. Then call Cotta (TWX-RK 7720 or phone WO 4-5671) for details.

COTTA

HEAVY-DUTY TRANSMISSIONS



Pumping



Locomotives



Construction

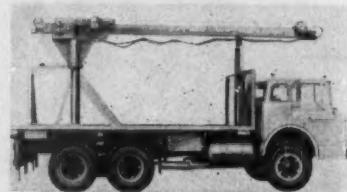


Drilling

COTTA TRANSMISSION CO., ROCKFORD, ILLINOIS

EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.



Truck-Mounted Crane Loads, Unloads Materials

Handling concrete blocks or other palletized materials is a one-man operation with the Hawk loader-unloader. It is a self-contained, hydraulic crane that fits all truck chassis from 17½ ft to 24 ft in length.

Both the retractable boom and the worm-gear-driven winch are hydraulically powered. A spring-loaded retainer keeps the boom from bouncing when traveling between jobs. The boom rotates a full circle in either direction, and the crane can unload materials to a depth of 15 ft below grade.—Curtiss-Wright Corp., South Bend Div., South Bend, Ind.

Circle 310 on Reader Service Card



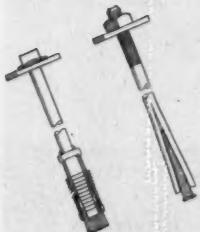
Grader-Mounted Disk Harrows

Caterpillar No. 12 and No. 14 motor graders now can be equipped with disk harrows that attach to the grader's blade and scarifier lift arms by spring-loaded linkages.

Two models of the Rome disk plowing harrow are available. One is a 16-disk unit with 12-in. disk spacing. It can be used for scarifying, mixing and blending, aerating, and pulverizing road materials. The other model consists of 22 disks spaced 6 in. apart. This model is designed for maintenance of oil roads.—Rome Plow Co., Cedartown, Ga.

Circle 311 on Reader Service Card

DANGER! ROCK SLIDES



Bethlehem rock bolts minimize the danger of rock slides by locking together stratified rock slabs. They are also widely used in railroad and mine tunnels where they reduce the danger of roof falls.

STEEL ROCK BOLTS . . . MADE IN TWO TYPES

Bethlehem makes a 1-in. diameter wedge-type slotted bolt; we also supply a headed bolt, which comes in $\frac{5}{8}$ -in. and $\frac{3}{4}$ -in. diameters. Both rock bolts perform the same function.

The wedge-type slotted bolt is driven with percussion tools, wedge-first, into pre-drilled holes. The wedge spreads the slotted end to provide firm anchorage. Plate washers, 6-in. square, are used for additional support.

The headed rock bolt is used with an expansion shell. When the bolt is tightened, the leaves of the shell expand, locking the bolt tightly in the hole.

Solve the rock-fall troubles along your right-of-way with Bethlehem rock bolts.

For full details contact your nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Contractor A. J. Baltes completes tackling tough highway and heavy jobs with

One of Ohio's long established, successful contracting firms is the A. J. Baltes company, of Norwalk, Ohio. This organization's history began in the early 1900's when A. J. Baltes founded it as a proprietorship. In the beginning he engaged in sub contract work, gaining experience in sidewalk work, pavement curbs and gutters in the Michigan and Cleveland, Ohio area. In 1916 he gained his first state highway contract for \$25,000. The equipment used to serve that job was a two bag steam powered concrete mixer, a five ton truck, a skip hoist car unloader, water pump and pipe line.

As new and better equipment became available, A. J. Baltes purchased it, and was able to bid with increasing success on highway work in and around Norwalk, Ohio. By 1942, the company had incorporated and annual volume had reached \$1 million. Operations were extended into twelve different counties and the permanent staff increased to ten. By 1960, Mr. Baltes' new generation of co-workers (as he puts it), had helped the firm grow to a permanent staff of 78 members and up to 850 workers when operations are at their peak.

TEAMWORK KEY TO CONTRACTOR'S SUCCESS

The A. J. Baltes management team consists of A. J. Baltes, president; John Baltes, vice president; Chuck Amato, vice president, operations; Charles Baltes, treasurer; and Robert Dempsey, chief engineer. How this firm grew under this management team is evidenced by its equipment expansion that saw an increase from 14 tractors in 1942 to 30 in 1960; 1 paver compared with 3; 5 pickup trucks compared with 35 today; 6 scrapers compared with 23 and 4 graders and 10 currently working.

With the acquisition of new equipment, Baltes bid successfully on diversified types of construction. Today, the company engages in airfield and highway paving, grading, earthmoving, bridge work, sewer, reservoir, dam work and industrial plant sites. Most of this work is carried on in Ohio and some projects extend into Pennsylvania.

In a five year period from 1955-1959, the company completed in excess of \$25 million of work. In 1958, a total of \$12 million of contract awards was received. In 1959, Baltes completed \$8 million of work, and according to management, can expand this gross. To complete this work load, a total of more than 600 units of equipment, valued at some \$5 million is put to work. In order to meet the increased needs for efficiency in its construction operation, Baltes is continually expanding its equipment inventory . . . in addition to double shifting projects on tight work schedules. In 1958, for example, \$400,000 was invested in a variety of equipment . . . and an additional \$600,000 was spent in 1959. It's not uncommon for Baltes to work a second shift on jobs under flood lights. Equipment worked under these conditions produce efficiently and effectively enough to justify the shift, according to John Baltes.

APPLIES NEW TECHNIQUES AND EQUIPMENT

New techniques in the use of equipment . . . and new adaptations on the equipment it now owns, account for much of this contractor's stepped up job efficiency. And much of the new methods and even new machinery have been contrived by A. J. Baltes, the company's president. His willingness to tackle the difficult, challenging jobs, plus a combination of ingenuity have played a big part in the organization's success.

(Listed below is the major equipment operated by
A. J. Baltes, Inc.)

AIRPLANE AND 2-WAY RADIOS SPEED OPERATIONS

Time is a contractor's bread and butter. And any way A. J. Baltes can save time and speed up operations, improves the profit picture. One of the keys to this contractor's efficiency of operations is the use of its own airplane and twenty-five two-way radios. Key job personnel have 2-way radios and five base stations provide the necessary range for coordinating widely scattered operations.

Cranes, derricks, draglines, shovels — (Manitowoc, Bucyrus-Erie, Lorain, Northwest, Lima)	10	Graders — (Caterpillar, LeTourneau-Westinghouse)	2	Sugarcane — (Cane-Axe, Buckeye)
Gradalls	3	Rooters — (LeTourneau, Esco)	2	Form tampers — (Cleveland, Jaeger)
Buckets — concrete	1	Ripper — (Kelleys)	2	Burlap bridge
Buckets — clamshell	1	Harrow — (Rowe)	2	Mixers, transit — (Jaeger)
Buckets — dragline	1	Plow — land clearing — (Winget)	2	Mixers — other
Front end Loaders — (Allis-Chalmers)	4	Trenchers — (Buckeye, Cleveland)	2	Rock crushers — (Rogers, Diamond)
Tractors — crawler — (Caterpillar, Allis-Chalmers, International-Westinghouse)	17	Belt loaders — (Euclid, Kohlman)	2	Cement silo storage — (Johnson, Heitzel)
Tractor	29	Buildings — field offices	7	Aggregate silo storage — (Johnson, Heitzel, Butler)
Bulldozer attachments	9	Buildings — parts, tools, other	6	Spreaders — stone — (Blaw-Knox, Jersey, Buckeye, Burch)
Brush rake	2	Automobiles	3	Saws — concrete
Push blocks, attachments	8	Hoists	11	Saws — chain, electric hand
Trucks — earth-moving — (Euclid)	25	Wagons — direct hitch	1	Tar kettle
Trucks — pickups — (Chevrolet, Ford)	5	2-Way radios — (Motorola)	2	Joint sealers
Trucks — stake, dump and other — (International)	1	Base stations — (Motorola)	2	Scales, truck — (Fairbanks-Morse, Thurman)
Trailers — lowboys	1	Fork lift	9	Concrete Vibrators — (Jackson, Stow, Chicago — Pneumatic, Marvel)
Trailers — other	1	Karry crane	1	Generator
Scrapers — self-loading — (Caterpillar, Allis-Chalmers, LeTourneau-Westinghouse)	25	Pumps	14	Compressors — (LeRoi, Gardner-Denver)
Scrapers — tractor drawn — (LeTourneau-Westinghouse, Gar Wood)	4	Boilers	6	Breakers — pavement
Rollers — (LaPlant-Choate, LeTourneau, Bros, Buffalo-Springfield)	4	Pavers — (Koehring)	6	Jack hammers
Vibrator-Compactors — (Maginnis)	4	Sprayers — Concrete	3	Wagon drills — (Cleveland)
Rollers — tandem — (Galion, Buffalo-Springfield)	4	Joint Machines — (Flex-Plane)	2	Rock drills — (McCarthy)
	2	Finishing Machines — concrete — (Jaeger, Koehring, Flex-Plane)	1	Drill — other
	4	Spreaders, concrete — (Blaw-Knox, Jaeger)	16	Tampers — backfilling
	4	Form Graders — (Cleveland)	12	Welders — (Lincol, Hobart)
	2	Pin pullers	13	Light plants
			1	Airplane — (Piper Apache)

\$7 million of construction new ideas and equipment

to transport executive and top management personnel to job sites. John Baltes, vice president, does much of his own flying from job to job. The plane also speeds up the transportation of maintenance parts, thereby cutting equipment downtime to a minimum on job sites. The company's rigid maintenance program requires an expenditure of around \$600,000 a year and keeps 60 men working both in the main shop and in field shops. This maintenance operation is directed by Charles Baltes, vice president.

TEAMWORK KEY TO SOUND PURCHASING POLICIES

The A. J. Baltes company is constantly striving for new and more practical methods of working equipment. A. J. Baltes has been responsible for many innovations and modifications in new equipment that the industry as well as his company is now employing.

According to John Baltes, vice president:

"the equipment needed for our jobs is determined by the superintendents and project managers of the jobs. The opinions of our key men are always considered before we make equipment purchases. Our training program includes a day's discussion on equipment, whereby we get the opinions of superintendents, foremen and mechanics. This teamwork helps in our buying decisions."

MATERIALS EXPENDITURES RUN 50% OF GROSS

The materials requirements of contractors engaged in heavy engineered construction runs about 50% of gross volume of work. In its 1959 contracting operations, A. J. Baltes required six million pounds of structural steel, and 165,000 barrels of cement. Fuel requirements for the year came to \$150,000.

CONSTRUCTION METHODS SERVES CONTRACTORS OF ALL SIZES

Over 15,000 contracting firms of every size . . . small, medium and large . . . are served by CONSTRUCTION METHODS Magazine. The key men in the A. J. Baltes company subscribe to it for latest information on construction techniques, equipment, and materials. Advertisers, too, recognize the value of this publication in getting their sales messages into the hands of key men in important firms like A. J. Baltes, Inc., across the nation.



Pictured above is part of the A. J. Baltes fleet of tractors, scrapers, cranes, and graders in action on 4-mile section of Interstate Route 75, South of Dayton, Ohio.



A. J. Baltes, President and founder
A subscriber to CONSTRUCTION METHODS AND EQUIPMENT magazine since 1934, says:

"CONSTRUCTION METHODS is the most practical publication in the industry for contractors like us. It's easy to read and understand and offers ideas and techniques that can be applied to our construction problems. I also look to advertisements for new products and uses which may be of value to us."



\$4 million highway project South of Dayton, Ohio required removal of 2.3 mil. cu. yds. of dirt. 18 scrapers and 20 crawler tractors and 5 graders and 20 bottom dump wagons . . . 75 major units in all were required.



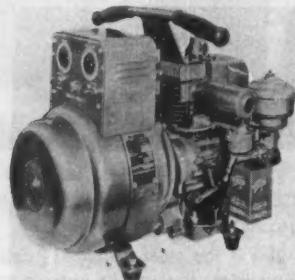
Part of the Baltes fleet of 35 bottom dump trucks shown in action, on earthmoving project.

Construction 
Methods 

A McGRAW-HILL PUBLICATION

EQUIPMENT NEWS...

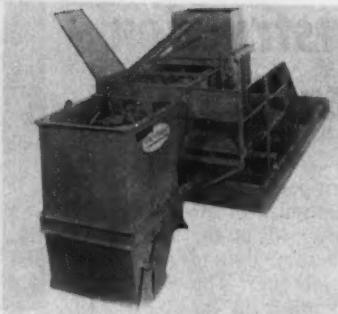
For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.



Portable Electric Plant

Rated at 2,500 w, this Winco engine-generator can carry a full load on a single 115 or 230-v circuit, or it can power motors up to 2 hp. All models of the 3I Series are equipped with Winco's idling control and are available with manual, electric, or remote-controlled starters.—Wincharger Corp., E. 7th and Division St., Sioux City 2, Iowa.

Circle 312 on Reader Service Card



Twin Shaft Stabilization Plant

Twin mixing shafts and a 9-ft tub can handle materials at the rate of 600 tph in this stabilization plant. All components of the Universal Thoro-Mix plant are assembled on a steel base, and the plant can be mounted either on wheels or structural steel supports. Clearance under the discharge hopper is 8 ft.

Inside the mixer, the paddle tips on the twin shafts can be reversed to retard movement of material through the mixing area. The tips can be replaced when necessary. At the end of the mixing tub is a

5-cu yd surge hopper with hydraulic clam type discharge gates.

Spray bars are equipped with calibrated, individually adjustable control valves. A single, lever-actuated valve controls the water supply to all spray bars without disturbing the individual control valve settings. A built-in centrifugal pump supplies the water and maintains it at the proper pressure, and a meter registers the amount of water passing into the mixer.—Universal Engineering Corp., 625 "C" Ave. NW, Cedar Rapids, Iowa.

Circle 313 on Reader Service Card

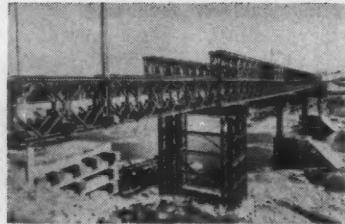
Two Industrial Engines

Ford has added one gasoline and one diesel engine to their line of industrial engines. The gasoline model has a displacement of 292 cu in.; displacement of the 4-cyl diesel engine is 172 cu in. Either may be bought as a bare engine or as a complete power unit including instrument panel, radiator, and sheet metal housing.—Ford Div., Ford Motor Co., P. O. Box 608, Dearborn, Mich.

Circle 314 on Reader Service Card

YOU CAN DO IT FASTER . . .

with Bailey Bridging . . .



For emergency, access, permanent or suspension type bridging. These versatile units also used for buildings, forms, trestles, falsework. Bridge shown here is over Smooth Rock Falls, Ontario, Canada, one of five Baileys used by Ontario Department of Highways in this area.



... and Uniflite Ferries . . . ►

Combined floating Uniflite sections provide transport across water for loads up to 100 tons! Other uses: floating platforms for derricks, cranes, piledrivers. Landing stages, wharves, piers, etc. Uniflite Ferry in photograph carried 30-ton equipment load across Harbour in Toronto, Canada.

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REPRESENTATIVES

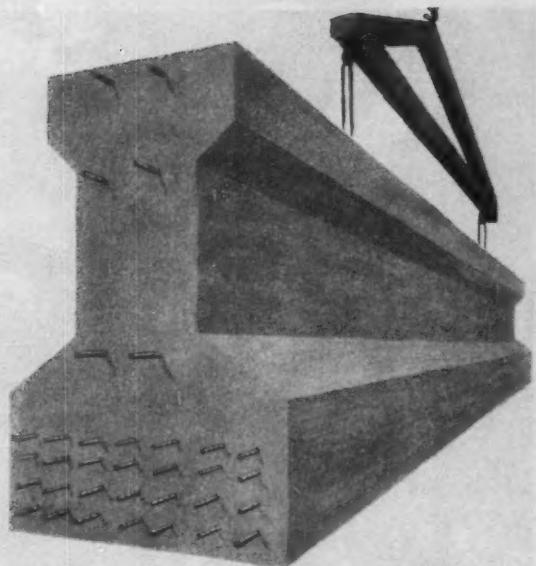
38 COMMERCIAL ROAD

Timberland Machines Inc.
25 Park Street,
Lancaster, New Hampshire

Mason and Bacon Inc.
McClure Building
Frankfort, Kentucky

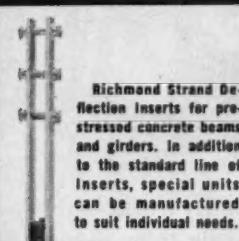
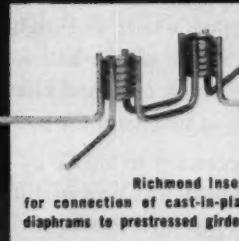
TORONTO 17, CANADA

FULL LINE OF DEPENDABLE ***Richmond*** PRODUCTS FOR EVERY KIND OF PRESTRESSED CONCRETE MEMBERS *saves time* *& money safely!*



Richmond, to meet growing demands created by the continually increasing use of prestressed concrete, has developed a full line of dependable, quality-tested strand deflectors, lifting inserts, void supports, anchors, all types of threaded inserts, form hangers and accessories for prestressed concrete beams, piles, slabs and girders.

These products have been designed and engineered, with the know-how gained thru 49 years of experience, to meet the needs of new, improved techniques in strand deflection, void support, lifting of and anchoring to prestressed members.

			
<p>Richmond Strand Deflection Inserts for prestressed concrete beams and girders. In addition to the standard line of inserts, special units can be manufactured to suit individual needs.</p>	<p>Richmond Chairs and Spacers for void supports and spirals in prestressed piles and beams.</p>	<p>Richmond Inserts for connection of cast-in-place diaphragms to prestressed girders.</p>	<p>Richmond inserts for anchoring to or hanging from prestressed members.</p>
			
<p>Richmond Extended Coil Tyscru for lifting prestressed beams and girders. (2 & 4 strut)</p>	<p>Richmond Inserts for anchoring guard rails to prestressed girders.</p>	<p>Phillips Self-drilling Concrete Anchors for anchoring to any concrete members after the concrete has set.</p>	<p>Richmond Offset Free-Fit Hanger Frame-Tys used to hang forms from prestressed "I" beams.</p>

Shown here are a few of the many Richmond-engineered products for the prestressed concrete construction industry. For more information about them, or help with any specific concreting problem, write to:

MAIN OFFICE: 816-838 LIBERTY AVENUE, BROOKLYN 8, N. Y.

Plants & Sales Offices: ATLANTA, GEORGIA; FORT WORTH, TEXAS; ST. JOSEPH, MISSOURI; LAUREL, MARYLAND.

In Canada: ACROW-RICHMOND LTD., ORANGEVILLE, ONTARIO.

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BOOTH 48, STATLER HILTON HOTEL, N. Y.—SEPT. 27-28-29-30**



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ASSOCIATE MEMBER PCI



JS-30'S SHIFTING WHEEL LICKS SNUG TRENCH JOB

THE CLEVELAND JS-30 TRENCHER, with instant lateral shifting and power tilting of its digging wheel, got high daily trench production on a utility job where trench had to be dug in a road shoulder hemmed in by poles, trees and heavy growth on side slopes rising sharply within six feet of the pavement's edge.

Crawlers were steered as necessary to sneak by obstructions, while the JS-30's digging wheel was power-shifted laterally, keeping trench digging right on line. Power-tilting of its digging wheel allowed the JS-30 to dig straight vertical trench with one track higher than the other on the side slopes, without blocking or cribbing.

THE JS-30—A TRENCHER OF AMAZING UTILITY

- Digging wheel power-shifts 5' from side to side
- Digs trench flush with parallel pavement, curbs, etc.
- Digs trench virtually flush with trees, poles, fences, etc.
- Digs vertical trench on side slopes, cuts blocking, cribbing
- Excavates bell holes, saves on trench width
- Digs 11"-24" wide, to 5½" deep; digs to 6' wide with power-shifting of wheel
- 100% control of all operations at operator seat.

Get the complete story on the JS-30 from your distributor

The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO

Good



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EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.



Heavy Roller

Weighing in at 50 tons, the Yuba-Southwest C-50 is teamed with the Caterpillar #619 tractor. Its draft beam is completely detachable. The multiple-box, pneumatic-tired roller features independent oscillation of the weight boxes for more uniform compaction.—Southwest Welding & Mfg. Div., 3201 W. Mission Rd., Alhambra, Calif.

Circle 315 on Reader Service Card



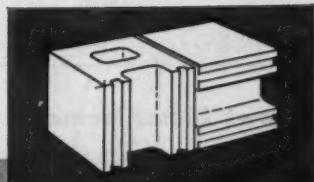
Compact Hydraulic Crane

It takes only 15 in. of space behind the truck cab for mounting this hydraulic crane. For highway travel the boom of the crane folds and telescopes to a width no greater than that of the truck; the center of gravity is directly above that of the truck. Extended, the F-6600ZX Foco-Crane can reach a maximum of 17 ft from the center of the truck. Maximum lifting height is 24 ft; it reaches 4½ ft. below ground level.

There are no gears, cables, pulleys, or winches; all crane operations are hydraulically controlled. The complete unit weighs 1,900 lb. At maximum reach it can lift 2,200 lb; with a short boom the maximum lifting capacity is 6,600 lb. The crane is equipped with safety valves to prevent overloading.—Focowil Corp., 79 W. Monroe St., Chicago 3, Ill.

Circle 316 on Reader Service Card

► Great new things
are shaping up in concrete block



Wall designed by Architect Alfred B. Parker, Miami. Photo courtesy of National Concrete Masonry Association.

Atlas Masonry Cement provides the right mortar

A notable thing about the new look in concrete masonry is what is being done with standard block. Here, for instance, a closed-lattice effect is achieved by laying up "stretcher" type concrete block, so that the ends are exposed. This basket-weave pattern creates an interesting exposed masonry wall resembling hand-hewn stone. For laying up this block, or any concrete masonry unit, ATLAS MASONRY CEMENT continues to be the preferred cementing material in mortar. It produces a smooth, workable mix, provides a strong bond, gives weathertight joints that are uniform in color. And ATLAS MASONRY CEMENT complies fully with ASTM and Federal Specifications. For information on masonry cement write: Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.

M-81

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United States Steel

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EQUIPMENT NEWS...

Gage Shows Diesel Hammer Output

Because Link-Belt diesel pile hammers have an enclosed cylinder head, their output cannot be measured by the WH formula (weight of ram x length of stroke). Now a gage is available to help owners rate their Link-Belt hammers.

The gage records the equivalent WH rating in ft-lb by combining the actual ram stroke and the extra "air spring" energy in the upper part of the cylinder. The instrument consists of a pressure gage, valve, piping, and an air hose connection. All are in a metal case with graph-type equivalent energy charts and instruction manuals. Extra lengths of hose permit use of gage at ground level.

—Link-Belt Speeder Corp., Cedar Rapids, Iowa.

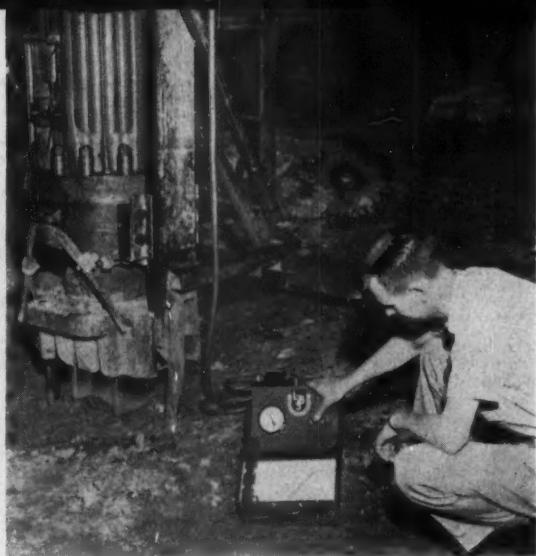
Circle 317 on Reader Service Card



Vinyl Blanket Cures Concrete

Specially formulated vinyl and industrial nylon make up this punctureproof concrete curing blanket. It can be used at temperatures as low as -40 deg because it does not become brittle or stiff. Also, the vinyl plastic skin does not absorb water, keeping the weight to a minimum even when wet. The fabric of this Herculite 30 blanket is nonporous and flame-retardant. A patch kit is available for on-the-spot repairs.—Herculite Protective Fabrics, 661 Fourth St., Newark 7, N.J.

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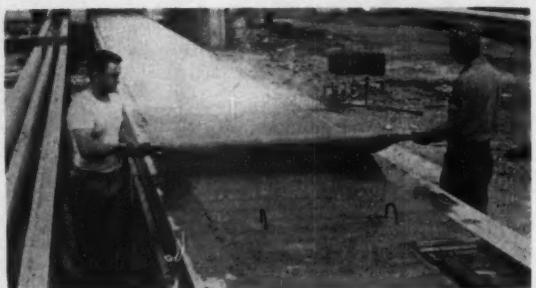


Crane Mounts Hydraulic Boom

The Bucyrus-Erie 11-BH Transit crane is rated at 12 tons. It is equipped with a hydraulically operated three-piece, telescopic boom that can reach 50 ft. A 10-ft boom extension and 10 and 20-ft-long jibs are optional for increased reach. Minimum boom length for highway travel is 25 ft. The boom's 12-ft upper section telescopes hydraulically, while an intermediate section has to be added manually.

Hydraulic outriggers are available also. With an additional hydraulic control valve, the rig can handle a $\frac{1}{2}$ -yd hydraulic clamshell bucket or a $\frac{3}{4}$ -yd materials handling bucket; equipped with a fairlead, the machine can work as a dragline.—Bucyrus-Erie Co., South Milwaukee, Wis.

Circle 318 on Reader Service Card



Flashing Light Warns Motorists

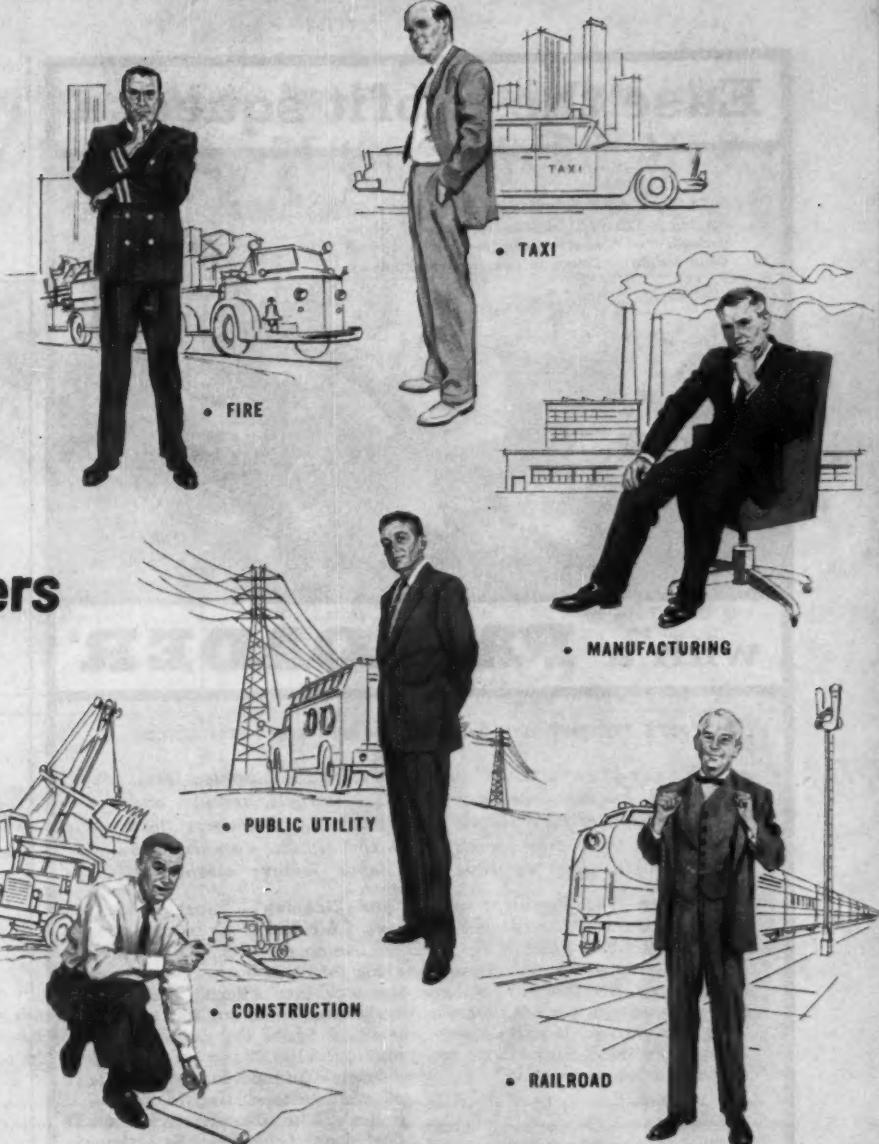
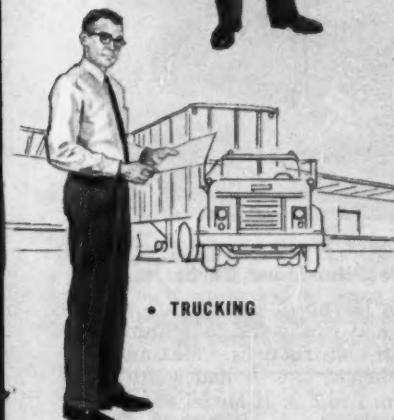
Either amber or red lenses are available for the Dietz No. 685 warning light. It produces 1,365 cp and flashes 50 times per min, and it can operate for 130 hr. Equipped with a mounting bracket and a carrying handle, but without batteries, it weighs 12 lb.

Two types of mountings are available. One is a mast-type mounting that contains two 9-v batteries; the other is an extensible tripod that raises the flasher 11½ ft above the ground.—R. E. Dietz Co., 225 Wilkinson St., Syracuse 1, N.Y.

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Circle 199 on Reader Service Card ➤

These experienced buyers of 2-way radio specify Motorola more often than all others combined...



Here's why your business can profit from the experiences of these long-time users.

1. *MOTOROLA has the most reliable equipment for long-run economy.* Records of experienced buyers prove Motorola 2-way radio works better, longer—therefore, it costs less.
2. *MOTOROLA engineers the radio system for your specific job.* Motorola sells exclusively through factory-employed 2-way radio sales engineers. You can always look directly to Motorola to completely satisfy your 2-way radio requirements.
3. *MOTOROLA equipment matches the job.* Motorola has the world's most extensive line—thousands of installations. There is a model to exactly meet *your* system needs.
4. *MOTOROLA provides nearby, expert service.* Motorola—through its nearby Service Center—will provide regular, programmed maintenance and assume full and undivided responsibility for the continuing peak operation of your system.

... Four excellent reasons why you should ask Motorola to plan your 2-way radio system.

Motorola . . . the communications specialist to industry for nearly three decades



MOTOROLA 2-WAY RADIO

Motorola Communications & Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Ill.
A Subsidiary of Motorola Inc.

SPaulding 2-6500

Ease the profit squeeze

Boom arms and 4-cu. yd. Drott 4-in-1 bucket on the big H-70 PAYLOADER are made of triple-strength "T-1" steel — eliminate over a ton of dead weight . . . increase your payload capacity.



with a **PAYLOADER**®

Owners report on 4-in-1 bucket performance:

We say a "PAYLOADER" equipped with the patented Drott 4-in-1 bucket combines shovel, clamshell, scraper and dozer action in a single tool. Enthusiastic owners spell out, in their own words, what this unique combination means to them in time and labor savings on-the-job:

Excavating—Vice-President says, "The 'PAYLOADER' with 4-in-1 bucket is the best piece of equipment we ever purchased. It will move more dirt than any other two competitive loaders that we have ever owned. It will do *anything*. We don't know how we ever did a job without it."

Construction—Owner says, "Our H-70 with 4-in-1 bucket is known as our third hand. This fact is proven daily by its unique versatility, practically eliminating hand labor. It can do clean-up work without excessive maneuvering. We have *controlled* material handling with the 4-in-1."

Pipeline—Foreman says, "The 4-in-1 versatility on rubber tires makes it the most useful single machine in my 15 years of pipe work."

Land Clearing—Superintendent says, "We had a lot of cedars to remove on this job. By just lowering the open bucket down over the top, then closing the clam, we yanked them out like pulling teeth. I figure the machine was making \$100.00 an hour. We also took out and loaded $\frac{1}{2}$ mile of old railroad ties in just 4 hours. With the clam open we peeled out 6 or 8 ties at a time, closed the clam and lifted them directly into the truck — just like taking the skin off an orange."

A sure way to "ease the squeeze" on your profits is to talk "PAYLOADER" with your Hough Distributor. He has the range of sizes to meet your needs, the widest assortment of attachments *plus* the most complete facilities in the tractor-shovel industry to keep your "PAYLOADER" investment profitable.

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200

EQUIPMENT NEWS...

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Ditcher Attachment For Wheel Tractors

All wheel tractors equipped with a three-point hitch can mount the 3P Pow-R-Ditcher. Power comes from the tractor's hydraulic system, and the pto shaft is equipped with a double disk friction slip clutch as a safety feature.

Digging widths range from 6 to 16 in., and maximum depth is $4\frac{1}{2}$ ft.—Vermeer Mfg. Co., Pella, Iowa.

Circle 321 on Reader Service Card



Compact Rig Builds Bituminous Curbs

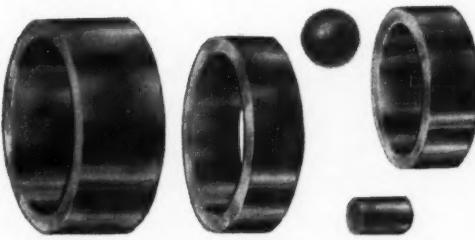
It can lay up to 4 ft of curb per min and can work to within 1 in. of obstructions. Maximum curb height is 6 in. and width is $8\frac{1}{2}$ in. The F & H Model 60 curb builder weighs only 340 lb and is 32 in. high, $63\frac{1}{2}$ in. long, and 19 in. wide, including handle.—F & H Products Co., 1531 Washington Ave., Piqua, Ohio.

Circle 322 on Reader Service Card

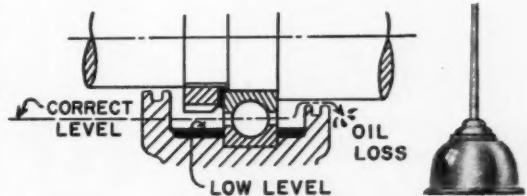
CONSTRUCTION METHODS



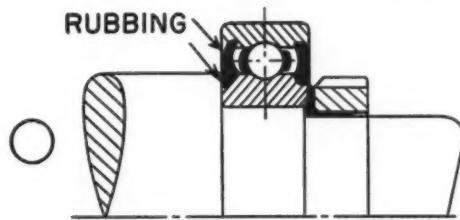
DISTRIBUTOR DAN, the **SKF bearing man, tells**
WHY BEARINGS BECOME OVERHEATED
and how to correct the conditions that cause excessive heat.



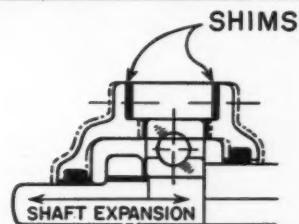
LOOK FOR THIS SYMPTOM. Discoloration of a bearing's rings, balls or rollers is a sure sign of overheating. The color is usually a gun-metal blue or bluish black.



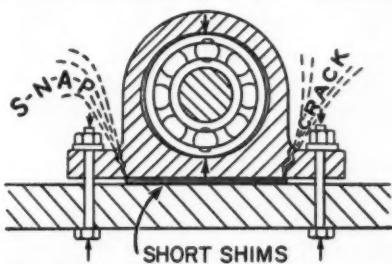
IMPROPER LUBRICATION OR LUBRICANT accounts for most cases of overheating. In pillow blocks, if oil is specified, fill only to the center of the lowest ball or roller in the bearing. If it's grease, the lower half of the pillow block should be filled. Therefore, be sure you're using the right lubricant—in the proper quantity.



RUBBING is a frequent culprit. Check the running clearance of the bearing seal. If it rubs against the shaft shoulder, re-machine the shoulder, to allow proper clearance. Bent lock-washer prongs are sometimes to blame. Straighten them or replace the washer.



EXTERNAL HEAT, conducted through the shaft, can make an inner ring expand excessively. It's usually the result of using a bearing with inadequate internal clearance. Make sure the replacement bearing is exactly the same as the original bearing. Should the markings be indistinct, consult an **Authorized SKF Distributor**.



THE BEARING HOUSING may be to blame—if it's warped or if the bore is distorted and out-of-round. Check to see whether the bore is pinching the bearing and relieve by scraping the bore. Make sure, too, that the pedestal surface is flat and that any shims cover the entire base area.

SKF

AUTHORIZED DISTRIBUTOR



6010



*Spherical, Cylindrical, Ball, **Tyson** Tapered and **REED** Miniature Bearings*

EVERY TYPE—EVERY USE

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*REG. U. S. PAT. OFF.



Left to right: J. R. Riggs, General Superintendent, with Joe Metz, Gulf Sales Engineer, and E. E. Snyder, Project Manager. On-the-job engineering service is one of the plus values you get when you deal with Gulf.

On the Niagara Power Project . . . 2 million cubic yards of **GULF MAKES THINGS**

The Niagara Power Project is the largest hydro-electric development in the Western World. Once completed, it will generate 2,190,000 kilowatts of electricity. Some 39 million cubic yards of rock will be excavated to prepare intake channels and foundations for two dams.

A vital part of this tremendous project is the 40-million dollar Tuscarora Pumping-Generating Plant. It's being constructed by the joint Tuscarora Contractors: Arundel Corp., L. E. Dixon Co., and the Hunkin-Conkey Co. Project Manager: E. E. Snyder. And behind him, 1,300

rugged crewmen and over two million dollars in construction equipment. Digging began on December 1, 1958. In one six-month period, this crew moved 1,300,000 cubic yards of rock—more than 1,000 cubic yards an hour.

Working with Tuscarora Contractors, Gulf engineers set up a preventive maintenance program that required only seven lubricants for all equipment. These multi-purpose lubricants keep the program simple and effective—all have built-in safety factors. And the program is economical. There are less products to buy. Ship. Store.



A really big project. Plans call for the removal of 39 million cubic yards of rock. It's the greatest amount to be moved since the construction of the Panama Canal.



Rip, tear and tug. Gulf lubes and greases help heavy duty construction equipment set the pace. No equipment has failed because of faulty lubrication.



Long haul. Blunt-nosed diesels have moved 2 million cubic yards of rock—without losing a transmission. The reason: Gulf Dieselube H.D.



Fill 'er up. On this project, diesels have guzzled over a million gallons of Gulf diesel fuel. Other vehicles have used a quarter-million gallons of Good Gulf Gasoline.

rock moved, and not one transmission failure . . .

RUN BETTER!

Del Lundmark, Equipment Superintendent, says, "We're the only contractor on this project who hasn't lost at least one transmission—and we've moved 2 million cubic yards of rock. I feel that the hydraulic fluid we use—Gulf® Dieselube H.D.—deserves much of the credit." Lastly, Del says, "None of our equipment has failed from faulty lubrication. And we've used over a million gallons of Gulf® diesel fuel, and a quarter-million gallons each of Good Gulf® Gasoline, Gulf Super-Duty® motor oil and other Gulf® lubes."

On your next project, see how Gulf makes things run better! You can do the job faster and reduce maintenance costs with Gulf products and service. Call your nearest Gulf office.

GULF OIL CORPORATION
Dept. DM, Gulf Building
Houston 1, Texas



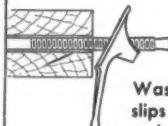
When job conditions call for this type of Heavy-Duty Tie . . .

use SUPERIOR TILT LOCK CLAMPS

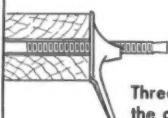
with SPECIAL
Safety-Type
Handle Washers



The malleable Handle Washer combines handle, washer and wrench—Designed for absolute safety; cannot fall off threads when load drops off or when handle is hit accidentally.

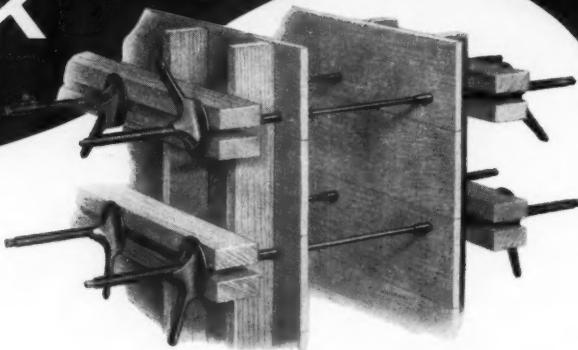


Washer, in tilted position quickly slips over stud rod threads to wale and is seated.



Three full turns on the threads of the outside rod bring it flush and tight against the wale. When pointing upward, the handle may be hit accidentally or pressure released during pouring. This may cause the handle to turn 180°, but the safety feature of 3 complete turns makes it impossible for the clamp to fall off the thread.

Tilt Lock Clamp Assemblies may be rented with a ninety day option to purchase.



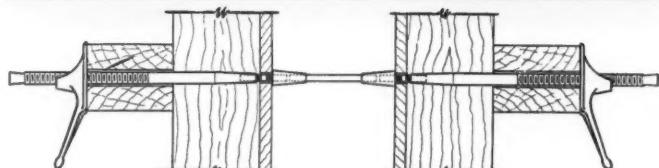
The "safety in use" of Superior's Handle Washers for Tilt Lock Clamps is shown at the left. The Tilt Lock Outside (Stud) Rods have outstanding features, too. The Outside Rod has $\frac{7}{8}$ threads, five to the inch, rolled on a $\frac{3}{4}$ " high carbon rod. This compares with the $\frac{3}{4}$ " thread cut on a $\frac{3}{4}$ " rod usually supplied. Cold rolled threads are tougher, and therefore more resistant to damage, and their contour greatly reduces the clogging of concrete and facilitates cleaning.

The Tilt Lock Outside Rod has a heavy cold forged rectangular end section that is $\frac{3}{4}$ " wide and $\frac{1}{2}$ " thick, to which the Handle Washer is applied as a removal wrench. This forged section is practically indestructible, never becomes rounded after numerous reuses as does a milled end. Therefore, it is never necessary to use a Stillson.

Superior Tilt Lock Clamps are supplied with Outside Rods 16" long and 20" long, for both $\frac{3}{8}$ " and $\frac{1}{2}$ " inside tie rods. Extensions are available where field conditions require Outside Rods longer than 20".

Superior supplies high tensile inside rods with rolled threads. Form layouts and estimates are prepared from plans without charge or obligation.

with Cone Nuts for Spreader Action



Where it is desirable to use Tilt Locks with Superior Cone Nuts for spreader action or other reasons, Tilt Lock Rods are adapted for use with Cone Nuts as illustrated above.

SUPERIOR CONCRETE ACCESSORIES, INC.

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LESCHEN WIRE **PORTER** ROPE DIVISION

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SEPTEMBER, 1960

EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the **READER SERVICE CARD**, which is just inside the back cover.



Big Portable Crushing And Screening Plant

Pioneer's Productioneer crushing and screening plant is equipped with a big jaw crusher and a roll crusher that is 30-in. wide and 40-in. in dia. The portable plant can handle 14-in. boulders and can produce three sizes of material.

Its three-deck vibrating screen is 5 ft wide and 14 ft long. The product deck can be changed without removing the top deck, and the second deck screen cloth may be removed from either end.

To reduce the size of the unit for travel, the entire rear assembly including the 90x28-in. bucket wheel and hopper can be detached without a crane.—Pioneer Engineering, Div. of Poor & Co., Inc., 3200 Como Ave., Minneapolis 14, Minn.

Circle 323 on Reader Service Card



Guard-Rail Erection Requires No Tools

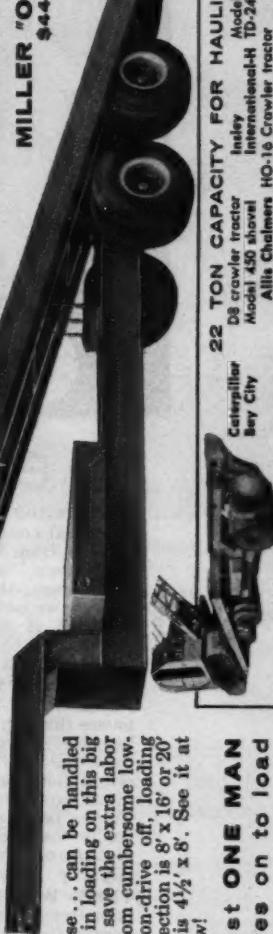
Heavy clamps equipped with a threaded handle attach this all-steel guard rail stanchion to the edges of slabs, ramps, bridges, and other structures. The stanchions can be installed on slabs with thicknesses ranging from 4 to 20 in. Rail height is 42 in., and the rail can be made of either 2x4's, cables, or ropes. All parts of the rail and stanchions are salvageable.—Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif.

Circle 324 on Reader Service Card

LOADS IN 3 MINUTES, yet HANDLES LOW-BED SIZE RIGS!

MILLER "OTS" 22 TON TILT-TOP

\$4493.50 F.O.B. Milwaukee, Wis.
Complete with platform, tires, two pairs of oil brakes, three hydraulic tilt cylinders, lights, reflectors and turn signals . . . tax included.



22 TON CAPACITY FOR HAULING
D8 crawler tractor **Intertec** Model 112" crane
Model 450 shovel **International-H** TD-24 crawler tractor
Allis Chalmers HO-16 Crawler tractor

... and just **ONE MAN**
drives on to load

Most of the heavy rigs you use . . . can be handled easier with less man hours lost in loading on this big new gooseneck Tilt-Top. You save the extra labor cost of detaching platforms from cumbersome low beds . . . gain Tilt-Top drive on-drive off, loading speed. Standard tilt platform section is 8' x 16' or 20' if desired. Stationary section is 4 1/2' x 8'. See it at your MILLER distributor now!

Circle 205 on Reader Service Card

Miller
Tilt-Top **Trailer** **Inc.**

457-P, 92nd St., Milwaukee 14, Wis.

at last...a construction heater with

no odor!

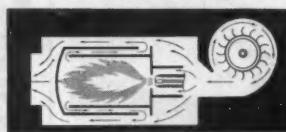
White Heat

no exposed flame!

All portable heaters are *not* alike. Lowell Shaum, electrical contractor, learned that in a single day. "Fumes from a new construction heater about got my men down," said Shaum. "Especially when they worked near the ceiling. Luckily, I was able to return it. Now we have a WHITE. What a difference! There's no odor at all." WHITE construction heaters now available in three sizes, cost no more than those that "belch" fumes and fire.

THE SECRET OF WHITE'S ODOR-FREE PERFORMANCE

Flame passes through stainless steel sleeve, then back through outer sleeve for more efficient combustion. Fumes, odors are actually "burned out."



Note furnace-type blower. No fans. No exposed flames.

DON'T BUY ANY HEATER UNTIL YOU'VE TRIED WHITE—Learn, as hundreds have, how truly odor-free a WHITE heater is. Ask your dealer for a free demonstration. If he doesn't have WHITE heaters in stock, ask him to wire for priority shipment *subject to your approval*. WHITE heaters are a product of White Manufacturing Company, specialists in construction equipment since 1925.

MAIL COUPON FOR TRIAL OFFER

ELKHART 6, INDIANA
Please rush catalog on new WHITE construction heaters.

name _____

address _____

city _____

state _____

name of favorite dealer

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EQUIPMENT NEWS...

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Powered Buggy

A single-stage torque converter drive eliminates clutching and shifting on the M-30A Power Truck. Its 18-hp, air-cooled Wisconsin engine is coupled directly to the converter and transmission. A 12-v electric starter is standard.

Two types of bodies are available for the rig. One is an 18-cu-ft dump body with a sliding endgate and a swinging tailgate. The other is a 42x42-in. flatbed.—The Prime-Mover Co., Muscatine, Iowa.

Circle 325 on Reader Service Card



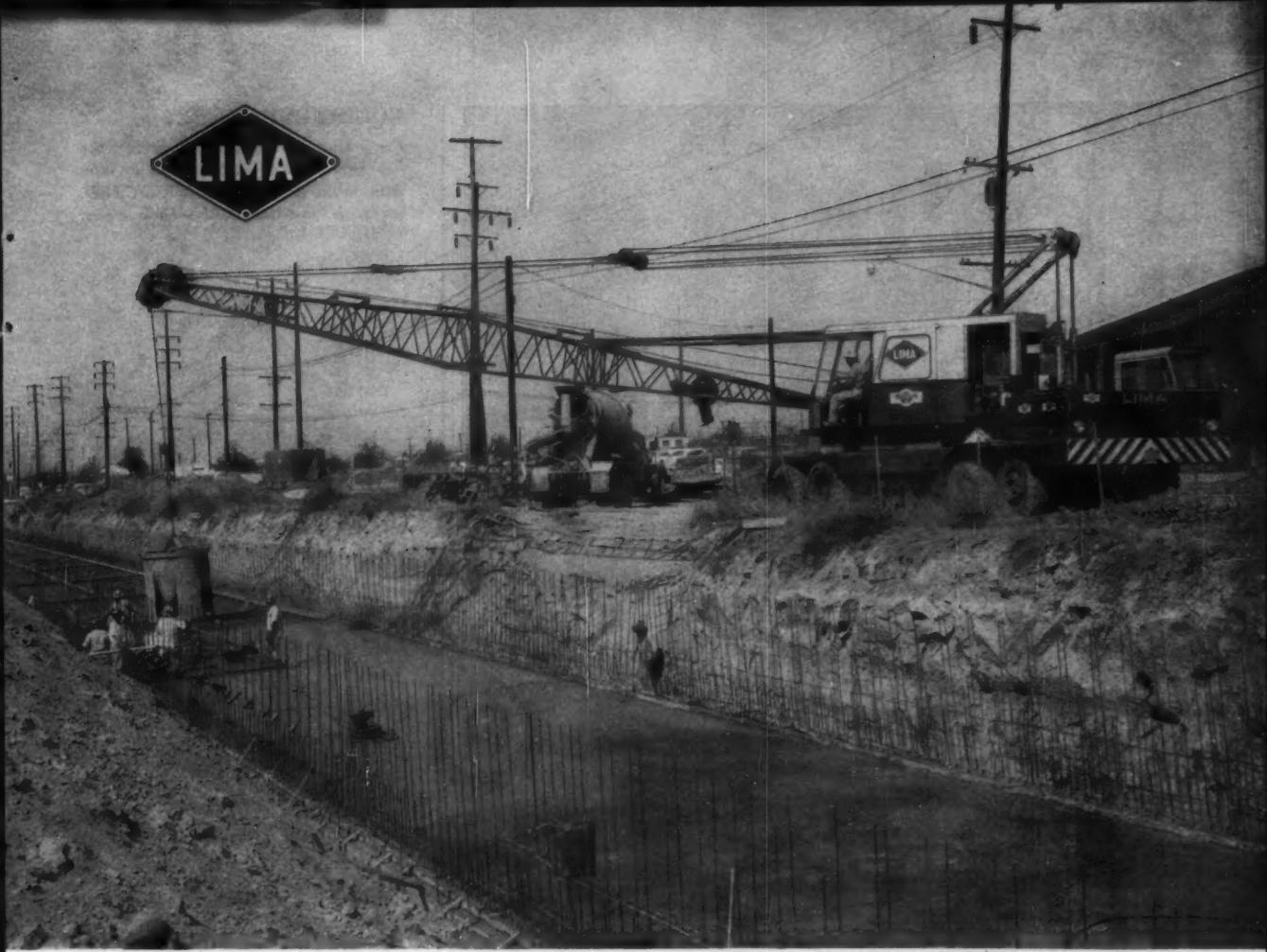
Screening Units Are Easy to Service

Access at the end simplifies screen cloth changes on these Hetherington & Berner gradation units. The panel sections overlap to eliminate the handling of single large screen decks. Lubrication requires only the attention to an oil reservoir because greasing has been eliminated by oil mist lubrication.

The units are available in 2 1/3, 3 1/3, and 4 1/3-deck arrangements. Sizes range from 3x4 to 5x16 ft. Vibration dampers and reversing brake controls are standard on most units.—Hetherington & Berner Inc., 701 Kentucky Ave., Indianapolis 7, Ind.

Circle 326 on Reader Service Card

Circle 207 on Reader Service Card ➤



Lima 64-T daily pours 320 yds. of concrete to speed construction of this Los Angeles County flood control channel.

Has two Limas...buys a third!

"Six years' experience with two 34-T Limas made us decide to buy another Lima when we were in the market for a third truck crane," says master mechanic Rex Williams, of R. A. Wattson Co., N. Hollywood, Calif.

Low maintenance

"We favor Limas for several reasons—easy operating, precision air controls; rapid transportability; low maintenance requirements, and simplified design. I'd say that Limas are

top-quality machines, engineered and built for dependable high output!"

The main frame and carrier components of the 64-T are of high-strength, low-weight "T-1" steel. This powerful rig needs no auxiliary aid to lift a 150-ft boom, plus 30-ft. jib, from the ground up. It travels anywhere a truck can go—speeds up to 25 mph.

Pays to buy Lima

There's a Lima type and size for

every lifting or digging job! Truck cranes to 80 tons, 140 tons on crawlers; shovels to 8 yds.; draglines variable.

Learn why cost-conscious crane owners and operators agree, "It pays to buy a Lima!"

Ask us for all the facts and figures.

See your nearby Lima distributor. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

6018





California paving contractor says:

Liked A-W roller so well, bought two more!

"Our first A-W performed so well that we bought two more over a period of 5 years. We use them to roll both subgrade and finish courses. They are fast and efficient machines; and can deliver the 95% relative compaction required. Torque converter allows more positive control of rollers for uniform compaction. Hydraulic controls make them easy to operate. Plenty of visibility for operators to do precision jobs. The A-W rollers are well-built; maintenance has been no problem."—Pat Regan, Exec. Vice Pres., A. J. Raisch Paving Co., San Jose, Calif.

A-W 3-wheel rollers available in 8 to 11, 10 to 12, 12 to 14-ton models; tan-

dems 5 to 8, 8 to 12, 10 to 14 tons. Portable tandem variable between 3½ to 6 tons. Vibratory Roller Compactor and Widener Attachment also available. Choice of gasoline or diesel power; torque converter with 4-speed transmission optional.

Austin-Western offers you a number of important dollar-saving features not available on many other makes of rollers. Let us prove to you the ways in which A-W rollers can increase your compaction efficiency and decrease maintenance and operating costs. Contact your nearby Austin-Western distributor or write directly to us.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

Circle 208 on Reader Service Card



EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

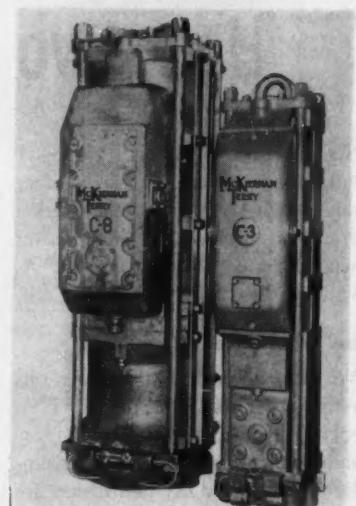


Built-in Device Protects Vibrator

In case the Thor CV3 vibrator overheats during operation, a built-in thermal shut-off control stops the motor to prevent burnouts. The device also restarts the motor automatically when it has cooled sufficiently for safe operation.

The CV3 vibrator is designed for use on 115-v ac current. It delivers 15,000 rpm. The vibrating head weighs 15½ lb and comes with a 10 or 20-ft flexible hose and a 25-ft, three-conductor cable with a submersible push-button switch.—Thor Power Tool Co., 175 N. State St., Aurora, Ill.

Circle 327 on Reader Service Card



Double-Acting Pile Hammers

McKiernan-Terry has expanded its line of pile driving equipment by adding a pair of double-acting pile hammers. Both are equipped with self-seating valves and a differential pressure lubricator.

The 8,500-lb C-3 hammer delivers 130 to 140 blows per min under average driving conditions. It works with either a 500 or 600-cfm air compressor or a steam generator utilizing 1,350 lb of steam per min. This hammer can handle piles with a bearing capacity of 60 tons.

The C-8 hammer is designed to drive heavy piles with bearing capacities up to 125 tons. This unit weighs 18,750 lb and delivers 77 to 85 blows per min. It operates with a 900-cfm compressor or a steam generator at 2,600 lb of steam per min. — **McKiernan-Terry Corp., Dover, N. J.**

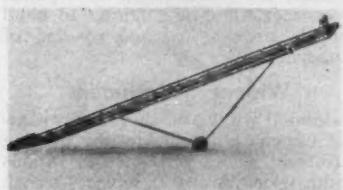
Circle 328 on Reader Service Card



Big Earth Auger

Capable of drilling 8-ft-dia holes, these Pengo units are designed for use with 5-in. Kelly bars. But they may be adapted to 3½, 4, or 4½-in. bars with Pengo bushings. The teeth on the Series AA augers are reversible and replaceable. — **Petersen Engineering Co., Santa Clara, Calif.**

Circle 329 on Reader Service Card



Portable Conveyors With a Long Reach

Identified as the PA-80 Series, these Barber-Greene portable conveyors are available with 18, 24, 30, and 36-in.-wide belts and in lengths of 69, 75, and 81 ft. Capacities range from 155 to 630 tph, depending upon belt width.

An electric motor drives the conveyor through a V-belt and a head-mounted torque-arm drive. A hydraulic boom hoist is standard, and a power-operated hoist is optional. — **Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.**

Circle 330 on Reader Service Card



Hydraulically controlled Model 210 A-W crane inches 18-in. cast-iron water main into position in San Diego County, Calif.

How A-W crane speeds pipelaying

"The more we use our 3-year-old Austin-Western hydraulic crane, the more uses we find for it," states B. K. Stoneman Sons, Inglewood, Calif., mechanical contractor.

"For instance," they add, "it is excellent for pipelaying. Hydraulic controls permit placement of heavy pipe with speed and precision. The telescoping boom lets the operator work pipe forward for a perfect joint without even moving the machine. All-wheel drive and steer mean exceptional maneuverability and traction on any surface. The A-W

is a real time and money-saver!"

Austin-Western now offers a complete line of *lift, carry and place equipment*. 5 models—capacity ranges up to 11 tons. Wide choice of optional equipment for added versatility. Available self-propelled, truck or stationary mounted. No other crane offers you all of the profitable advantages and quality construction features of an Austin-Western. Let us prove this to your satisfaction. Write for all the facts or ask your nearest A-W distributor.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

Circle 209 on Reader Service Card





LIMA ROADPACKER MODEL D

Compacts Fast, Wide and Deep on Macadam, Gravel, Crushed Rock, Sand, Soil Cement and Stabilized Bases

SAVE WITH SINGLE COURSE CONSTRUCTION

Lima Roadpackers meet the challenge—no other vibratory compactor gives you so many cost-saving job-speeding features . . . the reason why Lima Roadpackers are preferred by contractors throughout the world for fast production on highway and airport construction jobs.

Compare these profit-making features!

Heavy Vibrators

Six 437 pound vibrators deliver earth-shaking vibrations for deep, uniform densities. Vibrator units are completely sealed—no external moving parts. Vibrators are self-lubricated and need no daily maintenance. Required densities are quickly achieved. Macadam rock is tightly keyed, with screenings vibrated into voids in only three applications on most jobs. Compacts up to 600 tons per hour.

Infinite Speeds

20 feet per minute to 30 miles per

hour! A fluid motor propels the machine while compacting. A dial selector gives compaction speeds to match any job including new high production requirements within a broad range of 20 to 95 feet per minute. Roadpacker can be anywhere on the job at a moments notice. Heavy duty transmission provides fast highway travel speeds to next job.

One Lever Instant Reversing

Compacts forward or reverse with one lever control—no gear shifts—no de-clutching—no stopping. With the Lima Roadpacker you have no lost time and no depression in the material being compacted when machine is reversed.

Variable Working Widths

End shoes fold back for a selection of 4, 5 or 6 shoe working widths. Easily folded by the operator alone, the Roadpacker carries unused shoes ready for wider working widths at any

time. Folded end shoes permit Roadpacker to travel over highway.

Controls Up Front

Roadpacker controls are all grouped at operator's seat—engine gages and controls are mounted on dash panel. Foot accelerator in addition to hand throttle provides natural roading of Roadpacker.

Widener Attachment

Extension arm works shoes in a widening trench to 11" below the existing pavement. Quickly adapted to various width widening work; replaces trench rollers.

These are only a few of the advantages incorporated into the new rugged Lima Roadpacker, Model D. For complete information, see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

LIMA

Shovels—to 6-cu. yd.
Cranes—to 110-tons
Draglines—variable

LIMA SUPER ROADPACKER

For the large construction jobs such as superhighways, air bases and earth-fill dams, Lima offers the Super Roadpacker with two rows of six hydraulically controlled vibratory shoes. Compacting widths up to 15 feet.

LIMA AUSTIN-WESTERN

Crushing, Screening and
Washing Equipment

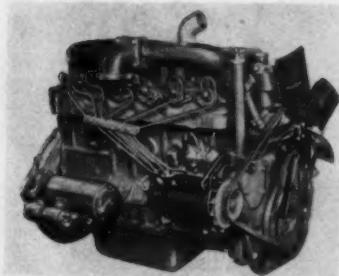
LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

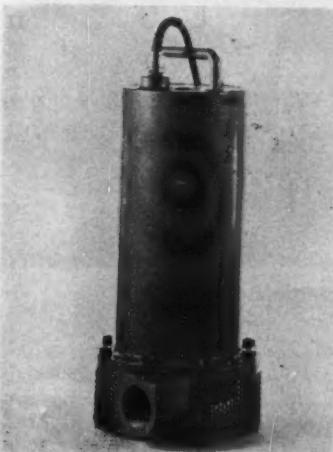


Lightweight Diesel Engine

Weighing in at 902 lb, the International Harvester D-301 engine delivers 110 hp at 3,000 rpm; the weight per hp is 8.2 lb. The 6-cyl, naturally aspirated, diesel engine has a displacement of 301 cu in. Compression ratio is 18 to 1. The engine is available on International trucks with gvw ratings ranging from 16,000 to 19,000 lb.

—International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Circle 331 on Reader Service Card



Submersible Pumps

Aqua-Cor self-priming, submersible pumps are powered by 1/2 to 2-hp electric motors that operate on 110-v, single-phase current. The motors are lubricated for life at the factory.

Pumping capacities range from 30 to 180 gpm, and pumps are available for 10, 20, 30, and 40-ft heads.—Welch Electric Co., 1221 Wade St., Cincinnati 14, Ohio.

Circle 332 on Reader Service Card

NEW POWER STEERING

REPLACES MECHANICAL GEAR ON CATERPILLAR 12 AND 112 GRADERS

Only 4 moving parts. Convert to power steering in less than 1 day. Fast, positive steering action works full time . . . increases efficiency of machine and operator. Simplified design cuts maintenance to absolute minimum.

See your CATERPILLAR Distributor TODAY or write:
R. H. SHEPPARD CO., INC. • HANOVER, PA.



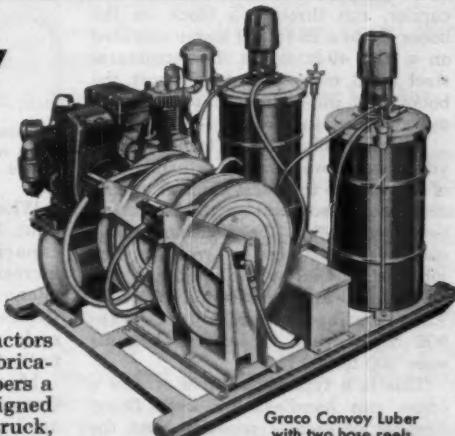
Sheppard Power Steering is original equipment on many models of Brockway and Mack Trucks, Koehring Dumpsters, Allis-Chalmers Graders, Huber Warco Maintainers and many others.

Circle 255 on Reader Service Card

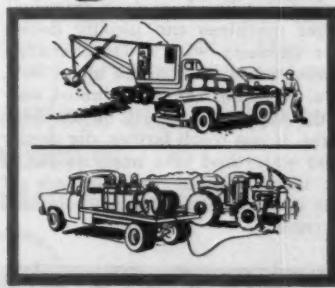
Save Time, Cut Costs with this PORTABLE LUBE UNIT

Small and large contractors who want "on-the-spot" lubrication find Graco Convoy Lubers a profitable investment. Designed for truck, trailer or pick-up truck, these lubers are easily mounted or removed . . . go to work immediately to provide fast greasing, oiling and air service in the field. You pump lubricants direct from the original shipping drums.

Free 28-page catalog illustrates Graco portable lube equipment. Includes tips and ideas for those who want to plan their luber to fit special operating conditions. Write for your copy.



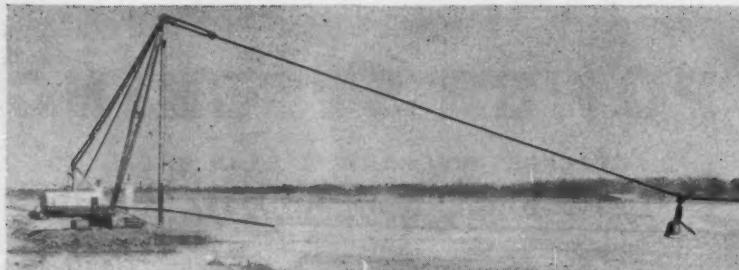
Graco Convoy Luber
with two hose reels



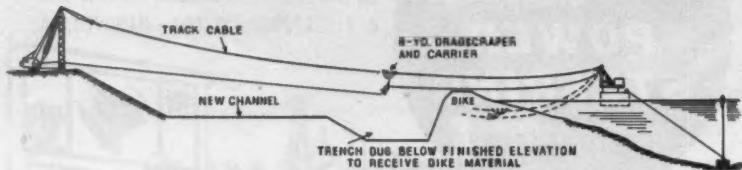
GRACO

946 Graco Square • Minneapolis 13, Minnesota
(See phone book yellow pages "Lubricating Devices" for Graco Suppliers)

Circle 211 on Reader Service Card



Eight-Yd. Sauerman DragScraper Cuts Seaway Dike Removal Costs

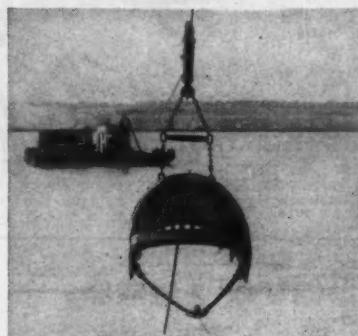


Atlas Construction Co. Ltd., Montreal, Que., had the job of enlarging the St. Lawrence Seaway channel near Iroquois, Ont. An 8-yd. Sauerman Crescent DragScraper and four-wheeled carrier was used with a crane to remove the perimeter dikes composed of tough digging glacial till and to backfill the trenches.

The hoisting line of the crane, used as a track cable for the Crescent and carrier, ran through a block on the boom tip to a 25-ft. tail tower mounted on a 20 x 40-ft. barge. The structural steel spud mast used to support the boom was pin-connected to facilitate movement of the crane.

After inhauling to the trench, the 8-yd. Crescent was gravity-returned part of the way to the excavation. A single-drum hoist mounted on the barge tail tower controlled the backhaul cable used to complete the return cycle. The job was handled by two operators, one on the crane and the other on the barge. The operating span varied from 600 to 900 ft. Average DragScraper hauls were 300 to 600 ft.

This is a typical example of how a crane can handle a Crescent DragScraper of greater capacity than the original dragline bucket or clamshell. Larger machines can usually double their capacity with a DragScraper. Smaller units can handle about 50% more. Machine range is limited only by the spooling capacity of the hoist drums. It can reach farther, dig deeper under water and take material out of soft areas without the nuisance of mats and the hazard of undermining the crane.



DragScraper traveling down track cable on return to underwater dike. Barge is in background.

When the boom is supported by a strut, a DragScraper of still greater capacity can be used. The strut increases overturning resistance and allows a greater load to be imposed. Crescents used in conjunction with such supports increase the rated capacity as much as 4 to 1.

Many operators consider the Crescent DragScraper as standard auxiliary equipment. The DragScraper permits bidding on and getting those premium jobs that could not be handled without considerably more time and expense by other means.

Find out how much you can increase your crane's capacity. Write or call giving the make, model number and boom length of your machine. Field Report 228 and Catalog J gives more information on DragScraper operations with cranes.

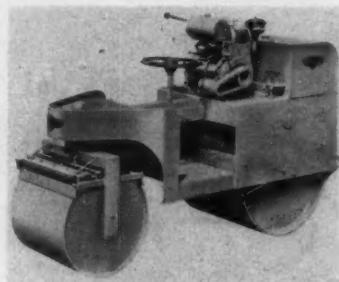
SAUERMAN

BROS., INC. 412 SO. 28th AVE.
BELLWOOD, ILL.
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent DragScrapers • Slackline and Tautline Cableways • Durolite Blocks

EQUIPMENT NEWS...

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.



Service-Free Roller

Maintenance is simple on the Essick 220 tandem roller because greasing is never required, according to the manufacturer. Another feature that simplifies servicing is a constant-mesh transmission with easily accessible clutches.

The 220 is a 1½ to 2-ton roller with its own custom-engineered trailer designed for loading and unloading by one man.—Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.

Circle 333 on Reader Service Card



Angle Dozer For Wheel Tractors

Massey-Ferguson tractors now can mount either a 72 or 84-in.-wide dozer blade that is controlled from the tractor's hydraulic system or from its own independent hydraulic system. The blade's moldboard height is 25½ in., and it is equipped with a reversible cutting edge.

Double-acting hydraulic lift cylinders able to exert down pressure move the blade up or down. The blade can be angled mechanically at 17, 24, or 28 deg. to either left or right and it can be offset 7 in. to either side of center.—Massey-Ferguson, Block 1000 S. West St., Wichita, Kan.

Circle 334 on Reader Service Card

330,000 yards of rock removed

by this shovel rigged with  **Tiger Brand Wire Rope**



In 15 ten-hour working days this $2\frac{1}{2}$ yard shovel scooped out 30,000 cubic yards of hard sandstone, shale and clay on the rebuilding of Route 39 near Salineville, Ohio. It had just finished another job where it had excavated 300,000 yards of rock . . . with no appreciable downtime.

USS Tiger Brand Wire Rope provides the tough, strong muscles that keep equipment working at top efficiency. These hoist lines must take the shock of digging rock. They must resist abrasive sandstone dust and severe vibration. In spite of these rough conditions, Tiger Brand Rope gives long service life with low cost.

No matter what kind of equipment you operate—shovels, scrapers, dozers, draglines, there's a USS Tiger Brand Wire Rope designed for the job.

Why Tiger Brand Rope is your best buy

It's designed by the country's leading wire rope engineers. It's made by *one* company that maintains the most complete research and manufacturing facilities in the steel industry. When you buy Tiger Brand, you get the right rope for the job . . . and you can get it quickly from leading distributors in your area. And your installation is no farther than a phone call away from experienced American Steel & Wire field service representatives.

For more information write American Steel & Wire, Dept. 125, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

**American Steel & Wire
Division of
United States Steel**



Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad



the man who backs his skill with Mobile Drill has a head start on any job he wants!

MOBILE DRILLS TEAM-UP in "land of the Little Big Horn"

Under the big Montana sky, a Mobile PACE-MAKER augered 7" vertical holes to 125' on the up-stream side of a high, wide fill to locate the water-table. A Mobile hydraulic-powered rotary rig bored 4" horizontal holes on the downstream side as deep as 684' to run-in perforated pipe and stabilize the fill.

The job totaled 10,000 feet of hole . . . 4,000' down and 6,000' across . . . in rugged mountainous country. It's another example of how Mobile equipment pays off in production . . . *pays off in profits.*

This unusual Montana job is described in detail in Case-History No. 1960-1. Write today for your copy . . .



MOBILE DRILLING, INC.
Dept. 28 • 960 N. Pennsylvania St.
Indianapolis 4, Indiana

Circle 214 on Reader Service Card

New Product Briefs

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

RUBBER REPAIR KIT — Components of the Holdtite Belt Repair Kit permit easy, on-the-spot repairs to conveyor belts and other rubber products. — U. S. Rubber.

Circle 335 on Reader Service Card

SANDBLASTER — The Handi-Blast sandblaster weighs 23 lb. It carries 30 lb of sand and consumes air at the rate of 8 cfm. Price: \$99.50.—Hamill.

Circle 336 on Reader Service Card

WELDING FLUX — Autoflux H-950 is designed for use with automatic submerged-arc hardsurfacing wires. It is available in 80-lb bags or drums.—Hobart.

Circle 337 on Reader Service Card

BLOWER FAN — D8 tractors and 583 pipelayers can be equipped with a self-cleaning fan that keeps vegetation from clogging the radiator.—Caterpillar.

Circle 338 on Reader Service Card

SMALL PARTS BIN — A table top, 56-compartment parts bin is 9 in. deep, 33 $\frac{1}{2}$ in. wide, 34 $\frac{1}{2}$ in. high. Compartment widths are adjustable.—Bay Products.

Circle 339 on Reader Service Card

TIRES — New lines of farm and special purpose tires are available for tractors, earth movers, graders, and a variety of trailers.—Cooper Tire and Rubber Co.

Circle 340 on Reader Service Card

IGNITION SHIELDING KIT — Kit (\$49.60 for 6 and 8-cyl engines) improves radio communications by cutting interference at coil, distributor, plugs.—Hallett.

Circle 341 on Reader Service Card

FUEL OIL ADDITIVE — A detergent additive, OFA 265, is reported to boost the life of injectors by protecting them from gums and rust.—Oronite Chemical.

Circle 342 on Reader Service Card

DIAPHRAGM PUMP — Powered by a 3-hp gasoline engine or a 1 $\frac{1}{2}$ -hp electric motor, this 3-in. pump has a capacity of 4,300 gph.—Midland Products.

Circle 343 on Reader Service Card

In Heavy Construction Equipment, too,

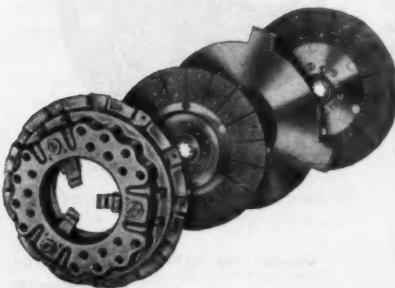
*the Trend is to **LIPE CLUTCHES***



Cost-conscious construction men count profits in terms of *actual* operating costs. Replacement clutches are measured not only by initial price, but also by the frequency and cost of repair and maintenance. All these factors add up to the growing trend among heavy equipment contractors to specify LIPE replacement clutches in dumps, cranes, shovels, earthmovers and other heavy duty rolling stock.

Simplicity, direct drive, easy adjustment

and replacement-exchange make the Lipe DPB the choice of construction men for truck GVW applications of 19,000 pounds and up. Built with fade-resisting chrome-silicon springs, and designed to shrug off shocks and dissipate friction-generated heat, the DPB stays in service longer, with lower costs for fuel, oil, brake relining and repair of all components in the power train. See your Lipe distributor soon. He'll show you why... *the trend is to LIPE!*



Lipe Heavy-Duty DPB
Clutches are available in
single and two-plate types;
12", 13", 14" and 15" sizes;
with torque capacities
from 300 to 1900 ft.-lbs.





Where heavyweights move job records prove... **FIRESTONE STAMINA KEEPS PROJECTS ON SCHEDULE!**

That sure-fire stamina of cord and rubber in Firestone off-the-highway tires pays off big. These dependable tires keep costly equipment on the go and meet tightest schedules. Such exclusives as Firestone Rubber-X—longest-wearing rubber ever built into Firestone tires—and Firestone Shock-Fortified nylon cord—that takes the most gruelling impact punishment in stride—see to that! Another plus: Firestone's Giant Tire Service stands back of every Firestone tire, and a Firestone Tire Expert will match tires to specific project needs and handle your tire maintenance problems. For more worktime and less downtime, see your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Co., Akron, Ohio.

ALWAYS SPECIFY FIRESTONE TIRES WHEN ORDERING NEW EQUIPMENT

Firestone

BETTER RUBBER FROM START TO FINISH



Super Rock Grip
Wide Base*

Super Rock Grip
Deep Tread*

TUBELESS OR TUBED

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*Firestone T.M.

NEW PRODUCT BRIEFS . . .

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

BITUMINOUS DISTRIBUTOR — Hand-wheel controls spraying operations and meter adjusts spray bar length on the Spray Master Distributor. — Littleford.

Circle 344 on Reader Service Card

POWER TROWELS — Six models make up a line of power trowels ranging in dia from 24 to 44 in. All feature one-point lubrication for easy maintenance. — Kelley.

Circle 345 on Reader Service Card

CURVED BLADES — U-Shaped dozer blades are available for new Cat D6B tractors. The blades are interchangeable with straight Cat dozer blades. — Balderson.

Circle 346 on Reader Service Card

MATERIALS FEEDER — Vibrating drive vibrates both lower and upper trays, combining materials feeding and sorting in one operation. — Cleveland Vibrator.

Circle 347 on Reader Service Card

ROCK RIPPER — The HR-D7 ripper is designed for Cat D7 tractors. Maximum ripping depth is 42 in.; either straight or curved shanks are available. — ATECO.

Circle 348 on Reader Service Card

CONCRETE FORMS — Average weight of Compo forms is about 5 lb per sq ft. Panels are made of steel frames and reversible plywood surfaces. — Irvington.

Circle 349 on Reader Service Card

TACK COAT SPREADER — This one-man-operated rig with swiveling spray bar deposits tack coats wide enough to match asphalt curb being built. — Miller Spreader.

Circle 350 on Reader Service Card

HYDRAULIC CONVEYOR — Traveling at 300 fpm, the belt delivers 1 yd of concrete or 1 ton of gravel per min. A 3-in. hydraulic motor drives the belt. — Sam Mulkey.

Circle 351 on Reader Service Card

LIGHTWEIGHT SCREED — Any small channel can mount this electric-vibrator-driven unit. The screed is handy for prestressing or precasting. — Vibro-Plus.

Circle 352 on Reader Service Card



You buy this premium STRENGTH shovel well below premium price

- You can pay \$12 a dozen more, but you can't buy as much shovel as you get in RAZOR-BACK.
- It's the only shovel forged with a thicker (13 gauge) center all the way down to the cutting edge, where other shovels wear out fast. Sides taper to 17 gauge to lighten weight.
- Socket is 11 inches — 2 inches longer than others. Handle is guaranteed highest strength ash, not weakened by chucking

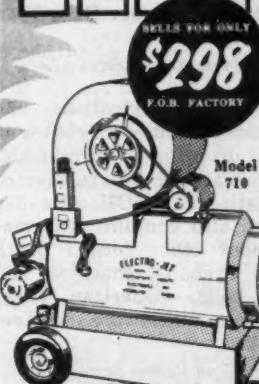
Circle 200 on Reader Service Card

RAZOR-BACK

THE UNION FORK & HOE COMPANY
Columbus 15, Ohio

Asphalt and Road Rakes, Concrete Spades, Mortar Hoes, Weed Cutters, Stone Hooks

Delivers Any Output up to 400,000 BTU's ELECTRO-JET



CONTRACTORS PORTABLE HEATER

Contractors tell us it's sensational! It really proved itself in the field — over 5,000 sold last year. Priced so low you can buy several!

- One simple oil burner pressure adjustment nearly doubles regular output 200,000 BTUs.
- Fully automatic. Lights instantly — up to 500 degrees in 70 seconds. Thermostat maintains constant temperature ranging from 10 to 90 degrees.
- Fully automatic oil burner burns No. 1 or No. 2 fuel oils. Runs 8 hours on one filling. Gas engine driven model priced slightly higher.
- 110 volt fan delivers 2,500 cu. ft. of air per minute.
- Lifetime guarantee.

DEALERS WANTED!

Make \$500 a week. Complete line. Exclusive territory.

WRITE FOR DETAILS TODAY

ELECTRONICS, INC.

3010 East Cherry, Vermillion, S. Dak.

I am interested. Please send more information on—

Electro-Jet Model 710 Portable Heater

Model 800 Heating Plant

I am interested in dealership. Send more information.

Name _____

Address _____

City _____

\$329 F.O.B.
Factory

Circle 217 on Reader Service Card



Make yourself HEARD! ... without Screaming your lungs out.

Just speak in a *normal* voice . . . and let your compact, lightweight, "one-piece" Audio HAILER do the work! New "TP" (transistor-powered) model projects your words . . . like a harpoon—in commanding "beam" . . . to anyone within a half-mile radius.

Yet Hailer is completely self-contained . . . NO external connections whatever . . . weighs only 5½ lbs. . . . and runs on low-cost standard flashlight cells. Coupon below brings full details and price list.

AUDIO HAILER

The original power megaphone, and most widely used "one-piece" portable voice system on earth. Weatherproof finish in two-tone green or fire engine red.



SUPER-HAILER
To penetrate through severe adverse noise levels . . . new SUPER-Hailer concentrates a 16-watt "sound beam" to pierce the surrounding roar. Mile range in quiet conditions.

AUDIO EQUIPMENT CO., INC.

Port Washington 39, N.Y.

- Send color brochure and price list, describing "TP" Audio Hailer.
- Send details of "TP" Super-Hailer.

Name . . .

Company or Dept. . . .

St. & No. . . .

City Zone No. . . . State . . .

218 Circle 218 on Reader Service Card

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy of the items you want, circle the appropriate numbers on the READER SERVICE CARD just inside the back cover.

WIRE ROPE—Bethlehem Steel's 156-p catalog, Wire Rope for Construction and Industrial Equipment, contains specific recommendations for the use of wire rope on power shovels, dredges, scrapers, dozers, derricks, hoists, pile drivers, pavers, overhead traveling cranes, conveyors, and winches. Rope reeving diagrams show typical line arrangements. The catalog also discusses rope features, grades, constructions, lays, and cores.—Bethlehem Steel Co., Bethlehem, Pa.

Circle 353 on Reader Service Card

CRUSHING—A 40-p Handbook of Crushing discusses the entire subject of mechanical size reduction. Crushing equipment and various reduction methods—impact, attrition, shear, and pressure—are described. The handbook covers factors to be considered in selecting crushing methods for particular applications and materials.—Bath Iron Works Corp., Pennsylvania Crusher Div., West Chester, Pa.

Circle 354 on Reader Service Card

TIE RODS—Specifications and descriptions of upset tie rods with weldless drop forged turnbuckles and clevis assemblies are covered in Bulletin No. 460U. The 4-p brochure also contains information about other forged parts, such as eyebolts, shackles, and anchor bolts.—American Forge & Mfg. Co., Nichol Ave., McKees Rocks, Pa.

Circle 355 on Reader Service Card

TRACTOR RAKES—A 2-p descriptive sheet gives details of Drott landclearing rakes, which are now available for cable or hydraulic operation on International tractors from the TD-9 to the TD-25. The rake's teeth are made of manganese molybdenum steel. Complete specifications are included in the sheet.—Drott Mfg. Co., 3126 South 27th St., Milwaukee 15, Wis.

Circle 356 on Reader Service Card

On the Job . . .
PORTABLE POWER
Speeds Work!
CUTS COST!



KATOLIGHT PORTABLE POWER PLANTS give your crews "plug-in" electricity anywhere, whenever it is wanted. Here is handy, dependable electric power to operate all types of power tools or to provide steady, bright flood lighting.

Standard sizes and models for every portable, standby or continuous use from 350 watts to 125 KW.

Special Units up to 750 KVA to meet specific requirements.

With instant, dependable Katolight power on the job, work speeds up . . . costs go down!

Write Today for Details!

KATOLIGHT CORPORATION
Box 891-106 MANKATO, MINNESOTA
Circle 257 on Reader Service Card



MAYO Tunnel Cars

feature practical designs and rugged construction. All cars can be equipped with Mayo's safe, automatic couplers.

• Side Dump Car (shown) has 2½ cu. yd. capacity. 24" gage.

• Rocker Dump Car. Ideal for sticky muck or wet concrete. 1 cu. yd. capacity 24" gage.

• Tunnel Car. Box body is removable and may be hoisted to surface to be dumped into truck. ½ to 2 cu. yd. capacity. 18" or 24" gage.

FREE Bulletin No. 16-b shows car details; No. 22 illustrates Automatic Coupler.



MAYO
TUNNEL AND MINE
EQUIPMENT
LANCASTER, PENNA.

Circle 258 on Reader Service Card

AN EXTRAORDINARY PUBLISHING ACHIEVEMENT OF OUR TIME!

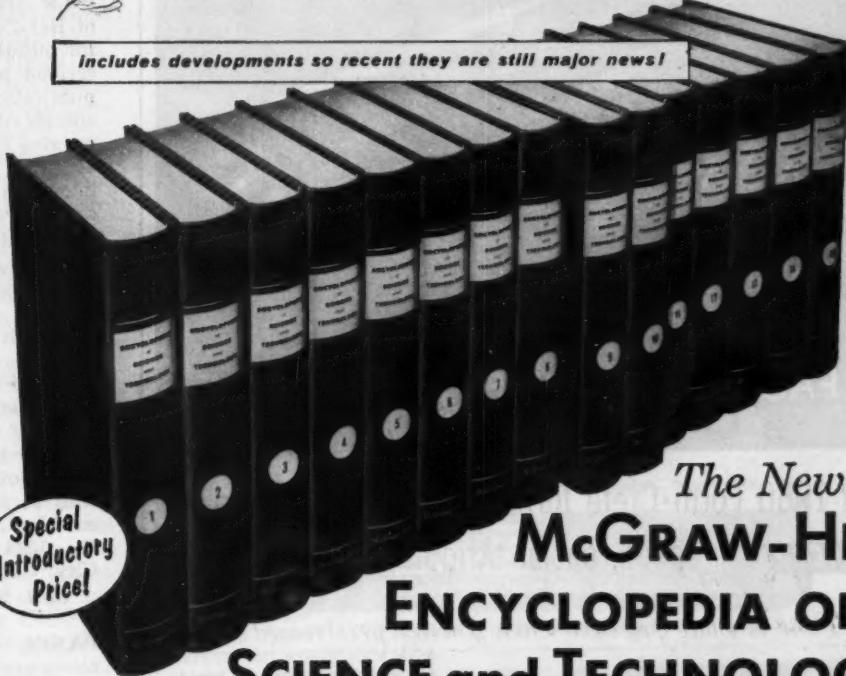
Here Are the Many Fields Covered:

ACOUSTICS
AERONAUTICAL AIRFRAMES
AGRICULTURE & SOILS
ANIMAL ANATOMY
PLANT ANATOMY
ANIMAL SYSTEMATICS
ASTRONOMY
ATOMIC, MOLECULAR AND NUCLEAR PHYSICS
BIOCHEMISTRY
BIOPHYSICS
CHEMICAL ENGINEERING
ANALYTICAL CHEMISTRY
INORGANIC CHEMISTRY
ORGANIC CHEMISTRY
PHYSICAL CHEMISTRY
CIVIL ENGINEERING
COMMUNICATIONS
CONSERVATION
CONTROL SYSTEMS
CYTOLOGY
ANIMAL ECOLOGY
PLANT ECOLOGY
ELECTRICAL ENGINEERING
ELECTRICITY
ELECTRONICS
FLIGHT SCIENCE
FOOD ENGINEERING
FORESTRY
GENETICS & EVOLUTION
GEOCHEMISTRY
PHYSICAL GEOGRAPHY
SURFICIAL AND HISTORICAL GEOLGY
GEOPHYSICS
GRAPHIC ARTS
GROWTH AND MORPHOGENESIS
HEAT
INDUSTRIAL AND PRODUCTION ENGG.
LOW TEMPERATURE PHYSICS
MACHINE DESIGN
MATHEMATICS
MECHANICAL POWER
CLASSICAL MECHANICS
METALLURGICAL ENGINEERING
METEOROLOGY AND CLIMATOLOGY
MICROBIOLOGY
MEDICAL MICROBIOLOGY
MINERALOGY AND PETROLOGY
MINING ENGINEERING
NAVAL ARCHITECTURE AND MARINE ENGG.
NUCLEAR ENGINEERING
OCEANOGRAPHY
OPTICS
PALEONTOLOGY
ANIMAL PATHOLOGY
PLANT PATHOLOGY
PETROLEUM CHEMISTRY
PETROLEUM ENGINEERING
GENERAL PHYSIOLOGY
PLANT PHYSIOLOGY
SOLID STATE PHYSICS
THEORETICAL PHYSICS
PLANT TAXONOMY
PROPELLION
PHYSIOLOGICAL AND EXPERIMENTAL PSYCHOLOGY
INVERTEBRATE ZOOLOGY



The Entire Span of Today's Scientific, Engineering and Technical Knowledge Encompassed in a Monumental Reference Work Containing 8,500 pages of Text, 800 Index Pages, 7,200 Articles and 9,700 Illustrations.

Includes developments so recent they are still major news!



Special Introductory Price!

The New
McGRAW-HILL
ENCYCLOPEDIA OF
SCIENCE and TECHNOLOGY

2,015 Contributors, including Nobel Prize Winners, Respected Leaders of Research and Industry . . . Over 6,000,000 Words — from Concise Articles to Amazingly Comprehensive Treatments . . . 100,000-Entry Index . . . a Wealth of Maps, Charts, Diagrams, Drawings, Photographs . . . many more than in any comparable work of reference.

An epoch-marking publishing venture — providing up-to-date, authoritative information on all the sciences of our day — is being completed. The new **McGRAW-HILL ENCYCLOPEDIA OF SCIENCE AND TECHNOLOGY** will make readily accessible within its 15 volumes a vast fund of knowledge covering hundreds upon hundreds of subjects dealing with the whole spectrum of the physical sciences, life sciences, earth sciences, and engineering.

This major work fulfills a prime need of the scientist, the engineer, the technician — whether concerned with pure research or practical applications — whether his work is of a design or operating nature — whether he wants to review or keep abreast of the vastly enlarged knowledge of his own field or must bridge the gap between his specialty and unfamiliar areas into which his work leads him.

Unequalled in Timeliness, Clarity, Depth

This unique library makes it possible for you to have as near as your office, laboratory, plant, or home an all-knowing corps of specialists to which you can turn for precise, authoritative information. You can get answers to specific questions raised through daily professional activities or simply explore in a random way the universe of today's scientific, engineering, and technical knowledge — distilled into 7,224 comprehensive articles. Whatever your own field, whatever field your work is related to, you will find it here.

A Work of Unsurpassed Authority

The names of the contributors read like a "Who's Who" of the world's scientific community. All are recognized specialists — in many instances, articles

were written by the very person credited with new discoveries and developments in a given field. Among them are Nobel Prize Winners and others who have distinguished themselves for their original and significant work.

Nothing comparable in breadth of conception, in authority, in usefulness, has ever before been offered in a reference work of this kind. As an all-embracing general reference or a practical working tool, this Encyclopedia belongs in the home and professional library of everyone with an interest in science and engineering. *An annual Supplement Volume keeps it always up to date.*

By reserving your first edition set now, you will enjoy the benefit of a special money-saving introductory price. Mail the coupon for full details.

MAIL THIS COUPON

McGraw-Hill Book Company, Dept. CM-9
327 West 41 Street,
New York 36, New York

Please send me without obligation your pre-view brochure on the new **McGRAW-HILL ENCYCLOPEDIA OF SCIENCE AND TECHNOLOGY** in 15 volumes; also details of your introductory price offer and terms of payment. (No salesman will call.)

Name.....

Address.....

City & Zone.....

State.....

CM-9

THESE VERSATILE FORMS insure uniform, accurate product pre-casting on a mass production basis. Square piling forms with form-lock are available in either single or dual forms.

**NOW-
STRIP
AND
RESET FORMS
FASTER THAN EVER BEFORE**

New 1960 Form-Crete forms feature more handling speed, easier stripping, longer service

Time is what you save when you cast prestressed

FOOD MACHINERY AND CHEMICAL CORPORATION FC 260
Form-Crete Department - Lakeland, Florida FC1
Gentlemen: Please send me your latest catalog on Form-Crete forms.

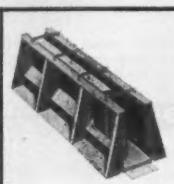
NAME _____
ADDRESS _____
CITY _____ STATE _____



Putting Ideas to Work

Form-Crete Department

General Sales Offices: Lakeland, Florida



FOR USE with any acceptable type of prestressing in current practice, the Form-Crete Bridge Beam form complies with joint P.C.I.—AASHO—recommendations. Form lengths in 10 foot sections, combinations up to 60 feet.



HOLLOW PILINGS are easily cast in these octagonal piling forms by use of tubing and piling headers. Unique tilt back design permits fast, easy product removal, cleaning and oiling of forms.



CHANNEL FORMS, with patented form-locks which allow sides to flex for quick and easy removal of product. Self-contained channel understructure insures extra rigidity and strength in this outstanding form.



FORM-CRETE LEDGER BEAM FORMS provide fast, accurate casting of roof support beams. Riser blocks can be employed to vary depth of beam; forms are lock-up type with reinforced self aligning pilot liners.

Circle 240 on Reader Service Card

NEW PUBLICATIONS . . .

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

PILE SHELLS—The advantages of Hel-Cor foundation pile shells for buildings and bridges are described in a 4-p brochure. The publication (PS-7760) contains specifications of the pile shells, ranging in nominal size from 10 to 21 in. ID. Also included is an explanation of how the pile shells are driven with a mandrel.—Armeo Drainage & Metal Products, Inc., Middletown, Ohio.

Circle 357 on Reader Service Card

ROLLING SCAFFOLDS—A 4-p folder covers Superior Scaffold's entire line of heavy duty, light duty, and general purpose rolling scaffolds. Featured are Fold-A-Way, Reddie-Roll, truss type, and light duty rolling scaffolds, as well as a variety of heavy-duty combinations.—Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif.

Circle 358 on Reader Service Card

PANEL FORMS—Atlas Compo forms are described in a 4-p folder. The forms feature reinforced corners, box-type stiffeners, and forged slots for the easy insertion of ties. The largest panel is 2 x 8 ft and can be handled easily by one man. Booklet A-60 also illustrates how to assemble and strip the panels.—Irvington Form & Tank Corp., 100 William St., New York 38, N.Y.

Circle 359 on Reader Service Card

HARDSURFACING — A 12-p booklet entitled Manual Hardsurfacing discusses the economics and metallurgy of hardsurfacing, analyzes the various conditions that demand surfacing, and provides information about electrode selection and procedures to produce the type of surface desired.—The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio.

Circle 360 on Reader Service Card

CRUSHING PLANT—Features of the Diamond 70 portable crushing and screening plant are covered in a 2-p descriptive sheet. The rotor-lift plant has a travel weight of about 58,000 lb and is designed for the aggregate producer who needs high capac-

ity and portability. It has a capacity of 125 to 175 cu yd per hr.—Diamond Iron Works, Goodman Mfg. Co., Halsted St. and 48th Pl., Chicago 9, Ill.

Circle 361 on Reader Service Card

CRAWLER TRACTOR—A 32-p booklet (L-1097) presents complete details of the newly introduced 100-hp diesel Eimco 103 crawler tractor line. It includes schematic drawings and complete specifications of the tractor, bulldozers, front-end loaders and log loader units in the series. Details of the power train, unitized construction, self-cleaning air cleaner, hydraulic track take-up, and full track oscillation are also illustrated.—The Eimco Corp., P.O. Box 300, Salt Lake City 10, Utah.

Circle 362 on Reader Service Card

LIFTING JACKS—Duff-Norton describes its full line of lifting jacks in a 4-p brochure. Bulletin 205A includes hydraulic rams and pumps, hydraulic jacks, ratchet lowering jacks, cable reel jacks, track jacks, screw jacks, trench braces, and motor attachments. Specifications are included.—Duff-Norton Co., Four Gateway Center, Pittsburgh, Pa.

Circle 363 on Reader Service Card

LOW-BEDS—Three different brochures have been issued by Rogers Brothers to describe different heavy-duty low-bed trailer models. One booklet covers the Custom T 15-40-ton trailer, and another details the TVT 15-35-ton unit. Both of these brochures illustrate the level deck and drop deck trailers and the walking beam axle assembly. The third brochure covers the THPG Hydraul-Lift detachable gooseneck trailers.—Rogers Brothers Corp., Albion, Pa.

Circle 364 on Reader Service Card

STEEL-PLY FORMS—A 20-p catalog presents complete details and applications of Symons steel-ply forms. Included is a description of the hardware arrangement for joining panels with panel ties, connecting bolts, and wedges. The catalog also contains information on new products and accessories developed by the firm, including gang forming bolts, all-steel pilaster forms, and the Lo-Wall steel trench form.—Symons Clamp & Mfg. Co., Dept C, 4249 W. Diversey, Chicago 39, Ill.

Circle 365 on Reader Service Card

BUY THE BEST...

Fibre-Metal's Quality

WINTER LINERS

for WARMTH & COMFORT

Warmth, durability, comfort and convenience are built into Fibre-Metal's completely new quality line of winter liners...for greater worker safety and "work ability." Designed for all safety hats and caps in the field, these winter liners are made of high quality, water-repellent, mercerized and sanforized fabrics...expertly tailored for maximum service life. Ask your welding and safety supply distributor NOW for our more descriptive bulletin or just order by model number and size.



Model FLF (Small and large sizes). Same as FLF but features zipper attachment of ear flap and neck section. For mild to frigid climates. Chin strap with adjustable snap. Provision for snap-on MF Mouthpiece to give additional face protection (as illustrated above).



Model FLN-E (Small and large sizes). Has yellow Neoprene-coated outer fabric for exceptional warmth retention and resistance to all wind and weather conditions (sleet, snow, rain!). Extra long neck. NO METAL



Model FLF (Small and large sizes). For cold to frigid climates. Heavy gray outer flannel, red knit lining. Long neck for extra wind protection. Chin strap with adjustable snap. Provision for snap-on MF Mouthpiece to give additional face protection (as illustrated above).

• • •

PARTS! Ideal for use with electrical safety hats and caps. Model FLF-E (Small, large and extra-large sizes). Same as FLN-E but with heavy gray outer flannel.

Many other models available!
For the BEST...for Maximum warmth and comfort...ORDER NOW!

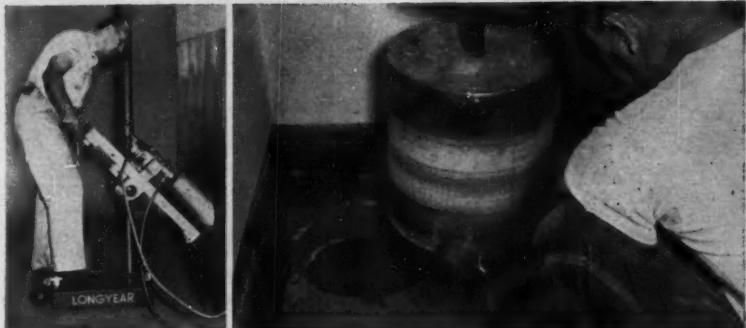
The **FIBRE-METAL** Products Company

In CANADA: Fibre-Metal (Canada) Limited, Toronto

CHESTER
PENNA

Circle 259 on Reader Service Card

CUTTING POWER!



14-Inch Holes in 5-10 Minutes!

Hundreds of 14-inch holes and many smaller ones were drilled with Longyear diamond bits through 5-inch terrazzo and reinforced concrete floors to air condition a 32-story office building. Each of the 14-inch holes took only 5-10 minutes of actual drilling time, and every Longyear bit drilled 100-120

holes! Every opening was clean and even, requiring no patch-up, and total cost of this big drilling job was surprisingly low. See your Longyear dealer and find out how the new Longyear industrial diamond drills can knock down your drilling costs.

Adv-167



E. J. LONGYEAR CO.

76 S. Eighth Street
Minneapolis 2, Minnesota
Phone: FEderal 9-7631

Please send complete information on Longyear Diamond Bits and Industrial Drills. Also the name of my nearest Longyear dealer.

NAME _____

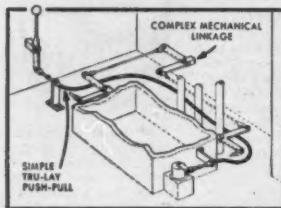
FIRM _____

ADDRESS _____

TOWN _____ STATE _____

Circle 221 on Reader Service Card

TRU-LAY PUSH-PULL DATA FILE SHOWS HOW TO SIMPLIFY AND IMPROVE DESIGN



Push-Pull remote controls, shown here, are flexible, have but one moving part, and give a lifetime of accuracy. Mechanical linkages are complex, are made of many parts, wear at many points, and produce increased backlash, lost accuracy, and vibration rattles.

This Push-Pull Data File—containing 7 engineering bulletins—will show you how these flexible controls have eliminated mechanical linkages on hundreds of products. You can make your products more useful, easier to sell, with Push-Pull controls. Write for your Data File today.



Automotive and Aircraft Division **ACCO**
AMERICAN CHAIN & CABLE

801-F Stephenson Bldg., Detroit 2 • 6800-F East Ave St.,
Los Angeles 22 • 929-F Connecticut Ave., Bridgeport 2, Conn.

Circle 260 on Reader Service Card



Advertisers' Literature

Listed below is free material offered in this issue's advertisements received up to Aug. 15. To get the items you want, circle appropriate numbers on the **READER SERVICE CARD** inside the back cover.

DRILLING—Case History No. 1960-1 tells how Mobile drills installed a perforated pipe to drain and stabilize a fill.—Mobile Drilling, Inc.

Circle 366 on Reader Service Card

HOISTS—Bulletin 34 presents specs and features of a full line of hoists for a wide variety of construction jobs.—Clyde Iron Works.

Circle 367 on Reader Service Card

TAMPER—Bulletin 593 details a tamper with 2,200-lb impact designed to propel itself at speeds up to 50 fpm.—Stow Mfg. Co.

Circle 368 on Reader Service Card

BUCKETS—Catalog describes the advantages of recessed lips and other features that are standard on Owen clamshell buckets.—Owen Bucket.

Circle 369 on Reader Service Card

BITS AND DRILLS—A 6-p. booklet provides information on a complete line of industrial drills and diamond bits.—E. J. Longyear Co.

Circle 370 on Reader Service Card

WEIGHING EQUIPMENT—Pendulums and other units for weighing from 1/100 oz to 100 tons are included in a brochure.—Detecto.

Circle 371 on Reader Service Card

PORTABLE HEATER—Details are available on Electro-Jet portable oil heater capable of delivering up to 400,000 Btu's.—Electronics, Inc.

Circle 372 on Reader Service Card

FORMS—Catalog tells how Form-Crete forms save stripping and resetting time in casting prestressed members.—Food Machinery.

Circle 373 on Reader Service Card

CONVEYOR BELTS—Bulletin M302 and Catalog CB25 describe heavy-duty belts for a wide range of materials handling.—Raybestos.

Circle 374 on Reader Service Card

POWER MEGAPHONE—Color brochure describes the transistor-powered Audio Hailer that runs on flashlight cells.—Audio Equipment.

Circle 375 on Reader Service Card

STEAM CLEANER—Here's information on the new 3500 Hypopressure

continued on page 225

**Useful
Unusual
Unique**

**FORGED NUTS
RODS • THREADED
RODS • TURNBUCKLES
• CLEVISSES
EYE BARS • LOOP
RODS • COUPLING
NUTS • SLEEVE NUTS
• SPECIALS**

LARGE FASTENERS
1 3/4" BOLT DIAMETER AND LARGER

FREE DATA ON LARGE FASTENERS

Describes all types of large fasteners for heavy machinery, power plants, bridges, ships, dams, docks, atomic plants, foundations. Write for Bulletin 160, Joseph Dyson & Sons, Inc., 5125 St. Clair Ave., Cleveland 3, Ohio, Phone HE 1-6157.

DYSON

**NOTHING'S
TOO BIG FOR
A DYSON
LARGE
FASTENER!**

Circle 222 on Reader Service Card

What's it **costing**

you
to train
new drivers?

\$1,000? \$1,500? \$2,000? These are normal costs for training new operators—except for TORQMATIC DRIVE owners. They report saving up to \$2,000 every time they break in a "rookie."

Reason? TORQMATIC takes guesswork out of shifting—ends shock-load damage and the need for engine-disconnect clutch repairs. TORQMATIC automatically adjusts engine output and speed to load or terrain changes.

TORQMATIC owners know that no operator can handle the "stick" and clutch as smoothly and efficiently—every time—as an Allison TORQMATIC. They bought TORQMATIC because they know, too, what it costs when rookies make a shifting and clutching mistake.

**How can you eliminate
these costs?**

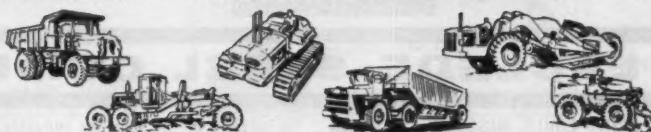
Look beyond first cost and see the total cost. Then change from clutch-pedal equipment to Allison TORQMATIC. You'll save costly engine-disconnect clutch replacements, too-frequent overhauls of overtaxed engines, repair bills for shock-load-damaged axles and drive lines.

Why not get the full story today? See your equipment dealer or write Allison.

ALLISON DIVISION OF GENERAL MOTORS
Indianapolis 6, Indiana

In Canada: General Motors Diesel Ltd.,
London, Ontario

Allison TORQMATIC



**TORQMATIC®
DRIVES**

*THE MODERN DRIVE FOR
MODERN EQUIPMENT*



giant sinews of LACLEDE STEEL add strength to the new Port Allen Locks



The Port Allen Locks in Louisiana will be an important link in the Mississippi River Freeway. With inland waterway traffic at an all time high, these locks will see plenty of action in the years ahead.

Strength and durability have been built into this massive concrete project with special large #18S Laclede Multi-Rib Round Reinforcing Bars.

General contractor for the new locks was T. L. James & Co., for the U.S. Corps of Engineers.



LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI



Producers of Steel for Industry and Construction

AD LITERATURE . . .

For more information, circle the key number found at the end of each item on the READER SERVICE CARD, which is just inside the back cover.

Jenny steam cleaner for heavy-duty rigs.—Homestead Valve.

Circle 376 on Reader Service Card

SHORING—Booklet presents full data on Waco Hi-Load heavy-duty shoring panel that carries 10,000 lb per leg.—Waco Mfg. Co.

Circle 377 on Reader Service Card

POWER CHAIN SAW—Full information is available on seven professional models of portable power chain saws, \$149.95 up.—McCulloch.

Circle 378 on Reader Service Card

LUBE UNITS—Booklet presents a variety of portable lube setups for service in the field regardless of the job size.—Stewart-Warner.

Circle 379 on Reader Service Card

MAINTENANCE TOOLS—Cars-Trucks-Tractors catalog lists hydraulic equipment, pullers, puller sets, hand tools.—Owatonna.

Circle 380 on Reader Service Card

CLIMBING CRANE—Brochure describes four models of the Concretor climbing crane, convertible to a crane on rails.—B. M. Heede.

Circle 381 on Reader Service Card

COMPRESSOR—Catalog JC-0 details the Jaeger 600 that produces its rated capacity at 1,700 rpm instead of usual 1,800.—Jaeger Machine Co.

Circle 382 on Reader Service Card

SHORING FRAMES—Bulletin PSS-51 details new 20K shoring frames carrying up to 10,000 lb on each leg.—Patent Scaffolding Co.

Circle 383 on Reader Service Card

DUMP TRAILERS—Booklet gives full information on dump trailers with four types of telescopic and piston hoists.—Trailmobile, Inc.

Circle 384 on Reader Service Card

PUSH-PULL CONTROLS—Data file shows how flexible remote controls eliminate mechanical linkages.—American Chain & Cable.

Circle 385 on Reader Service Card

FASTENERS—Bulletin 160 describes all types of fasteners with bolt diameters $1\frac{1}{4}$ in. and up for construction jobs.—Joseph Dyson & Sons.

Circle 386 on Reader Service Card

ACROWSPAN

Gives you the
QUICKEST
STRONGEST
SAFEST
supports for slab-decking

AT LOWEST COST

"Send for
literature"



NEW YORK • CHICAGO • DENVER • TORONTO • MONTREAL

Circle 225 on Reader Service Card

ACROW Denver, Inc., 1035 So. Huron St.
Denver, Colorado • Phone SP 7-5486

● ACROW, the world's largest formwork specialists offer features, benefits, advantages based on world-wide experience.

● ACROWSPAN... with only two basic components... gives you the greatest range. Built-in camber automatically set. Highest load carrying capacity. Work with ease on widest flange.

● ACROWSPAN is especially ideal when used in combination with high-load-capacity ACROW Steel Vertical Shore.

**NEW 3/4-ton
Pull-A-Way**
Added to **WRIGHT**
TYPE 'C' LINE!

FOUR SIZES • $\frac{3}{4}$,
 $1\frac{1}{2}$, 3 and 6 Tons

FEATURES

- Lubricated for life
- Hooks are drop-forged
- Special alloy-steel chains
- Chain sheaves of drop-forged alloy steel
- Gear teeth cut to precision limits
- Load brake is dependable and safe
- Weights:
 $\frac{3}{4}$ -ton, 12 $\frac{1}{2}$ lbs.
 $1\frac{1}{2}$ -ton, 23 $\frac{1}{2}$ lbs.
 3-ton, 36 $\frac{1}{2}$ lbs.
 6-ton, 63 lbs.



New 3/4-ton model
• VERSATILE
• LIGHTWEIGHT

Write to York, Pa., office for
complete information

Wright Hoist Division
AMERICAN CHAIN & CABLE

York, Pa., Bridgeport, Conn.



Circle 261 on Reader Service Card



LESCHEN WIRE **PORTER** ROPE DIVISION

H. K. PORTER COMPANY, INC.

Circle 262 on Reader Service Card

Satisfied Public Works Officials

comment on their Ellicott Dredges



Dayton, Ohio

Mr. W. T. Eiffert, Director, Department of Water writes, "We have never received such a complete piece of equipment, nor have we ever received such complete training in the operation of a new piece of equipment."

Blythe, California

Mr. O. E. Simmons, Manager, Palo Verde Irrigation District says, "All checks indicate that the dredge is exceeding the specified capacity. Our operators frequently comment on the simplicity of operation and the small amount of effort required to handle the control system."



Yaphank, New York

Mr. Albert Cass, Commissioner of Public Works, Suffolk County reports, "The versatility of our Ellicott 12" hydraulic pipeline dredge 'Shinnecock' has made possible a wide variety of local development projects."

Customer statements from all parts of the country and the world testify to the excellent design, quality and performance of Ellicott dredges and the service that accompanies them. These remarks concerning both standardized "DRAGON" models and the heavy duty dredges have come from both public officials and private owners.

If you are considering the purchase of a dredge, we will be glad to tell you more about what other owners of Ellicott dredges say, and provide technical details. Write to Ellicott Machine Corporation, 1605 Bush Street, Baltimore 30, Maryland.

2481

ELLIOTT DREDGES

ELLIOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Ellicott-Brant, Inc., Baltimore, Maryland; Ellicott Fabricators, Inc., Baltimore, Md.; McConway & Torley Corp., Pittsburgh, Pa.; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragages Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico.

Successors to the floating dredge business of the Bucyrus-Erie Company and the American Steel Dredge Co. Complete engineering, design and construction service.

Marking Our 75th Year

Circle 226 on Reader Service Card

226



AD LITERATURE . . .

Listed below is free material offered in this issue's advertisements received up to Aug. 15. To get the items you want, circle appropriate numbers on the READER SERVICE CARD inside the back cover.

PNEUMATIC EQUIPMENT—Catalog 600 gives full details on compressors, Reichdrills, rock drills, and bits.—Chicago Pneumatic Tool Co.

Circle 387 on Reader Service Card

LUBE EQUIPMENT—A 28-p catalog illustrates portable lube units, and includes tips for adapting unit to special conditions.—Gray Co.

Circle 388 on Reader Service Card

DRAGSCRAPERS—Field report 228 and Catalog J present detailed information about DragScraper operations with cranes.—Sauermaier.

Circle 389 on Reader Service Card

FRiction GUIDE—In simplified table form, 16-p book gives design data on motion-controlling friction materials.—Johns-Manville.

Circle 390 on Reader Service Card

SUPPORTS—Acrowspan literature details horizontal telescopic shores with built-in cambers to support slab deck pours.—Acrow Corp.

Circle 391 on Reader Service Card

PREFAB FORMS—Booklet shows how inside wall and fillet forms can be stripped without disturbing shoring for culvert roof slab.—Symons Clamp.

Circle 392 on Reader Service Card

CONCRETE BUGGY—Detailed information on powered buggies includes job estimating data and performance reports.—Prime-Mover.

Circle 393 on Reader Service Card

PORTABLE CONVEYORS—New Bulletin describes seven truss and channel frame conveyors, plus the 358 car unloader.—Barber-Greene.

Circle 394 on Reader Service Card

PANEL FORMS—Booklet gives details on rental of Uni-Form panels, a tailor-made forming system delivered to the job.—Universal Clamp.

Circle 395 on Reader Service Card

LOADER—Details on the Payloader equipped with the patented Drott 4-in-1 bucket are available in a booklet.—Frank G. Hough.

Circle 396 on Reader Service Card

GUARD RAIL—Booklet 514 gives detailed information on steel beam highway guard rail and results of a strength test.—Bethlehem Steel.

Circle 397 on Reader Service Card

CONSTRUCTION METHODS



How to get maximum service from your boom pendants

The next time you purchase cranes or power shovels, or re-rig existing equipment, be sure to specify Bethlehem Boom Pendants with swaged fittings.

Research clearly proves that these pendants are superior to pendants with spliced, socketed, or sleeve-type fittings. These superior pendants make ideal boom supports because they are engineered to absorb punishment caused by shock and vibration. They are made of Bethanized rope,

which means that each wire is zinc-coated electrolytically, then drawn to size, to provide maximum resistance to fatigue and corrosion.

Maintenance costs are reduced, for there is no need to constantly re-lubricate. Bethlehem Boom Pendants can also be fabricated of uncoated wire.

Bethlehem Boom Pendants are furnished in diameters, lengths, and styles to meet virtually every construction requirement. If you want full details, just call the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, Bethlehem, Pa. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL



You and **UNIT** earning power

... a payload partnership



Completely satisfied with the performance record of his two UNIT $\frac{3}{4}$ YD. excavators, Mr. James Lavin of JFL Trucking and Excavating, West Allis, Wis., says he'll pick UNIT again when buying a new machine.

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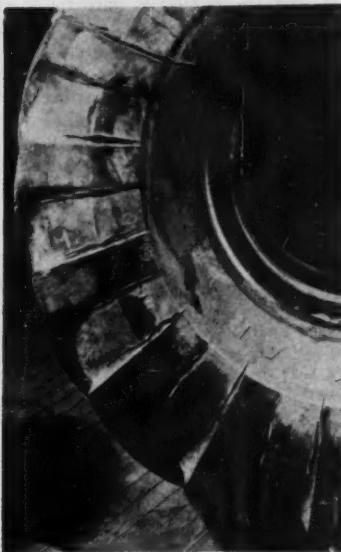
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DRAGLINES

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Maintenance Shop...



RADIAL CRACKS—Continued underinflation causes radial cracks in the tire walls.



BLOW OUTS—Continued overinflation may result in blow outs that can destroy tires.



FLEX BREAKS—Overloading often causes breaks due to excessive flexure of the tires.

Making Tires Go a Long Way

HUGE TIRES on earthmovers have boosted haul road speeds and cut the costs of off-the-road operations. But the savings can be lost unless a few common sense rules are followed to prolong tire life.

Key to such prolongation is daily tire inspections. The Construction Equipment Division's Service Dept. at International Harvester recommends that emphasis in checking tires be placed on the following four points:

- Checking inflation pressures.
- Inspecting cuts.
- Checking rims and flanges.
- Checking tire wear.

Inflation

Check tire pressures with a low-pressure gauge marked in 1-lb gradations. Do this in the mornings when tires are cool. If a tire is considerably underinflated, do not operate the vehicle until the cause of the air loss is located and the damage repaired.

Underinflation causes rapid wear on the outer edges of the

tread, as well as causing excessive flexing that builds up internal heat. Blow outs frequently result from this. Also, continued underinflation causes radial cracks in the tire walls.

Overinflation, on the other hand, causes rapid wear at the center of the tread and often leads to sidewall breaks due to impact loads. Should pressure build up during the day, it is advisable not to bleed the tires because the added pressure automatically compensates for heat generated during operations. This prevents sidewall flexing which would generate more internal heat.

Cuts

All cuts should be inspected. Cuts that penetrate to the tire's cord body must be repaired immediately, or they will spread quickly, causing severe damage to the tire. Shallow cuts should be skived with a knife or bullnosed rasp to prevent small stones from becoming imbedded in the rubber and working through the cords.

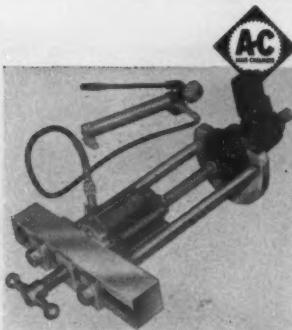
Rims and Flanges

Damaged rims and flanges should be checked carefully. If tires are dismounted for repair, the rims must be cleaned and painted to make mounting easier and to prevent rust damage. All oil or grease found on rim assemblies must be removed because it causes rubber to deteriorate quickly. It makes good sense not to park a vehicle overnight on a greasy or oily spot. Also, caked mud and rocks must be removed from tires, and especially from between rear-mounted duals.

Tire Wear

If uneven tire wear is detected, the cause should be located and corrected as soon as possible. Mismatched tires on dual assemblies result in unequal load distribution. The new, larger tire wears more rapidly, and the old, smaller tire usually scuffs severely. This can be avoided by mounting tires of the same diameter on dual assemblies. If it is necessary to use a slightly smaller tire, it *continued on next page*

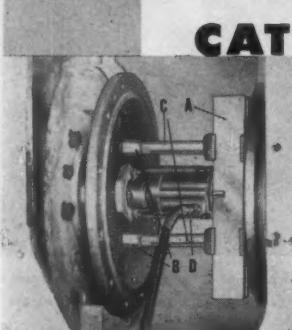
Cut "downtime"—and maintenance costs with time-saving OTC pullers



EXAMPLES:

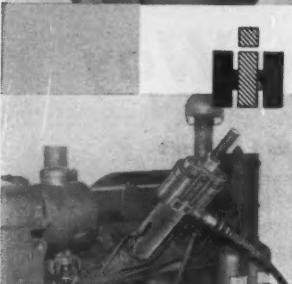
REMOVING AND INSTALLING HD-21 TRACK ROLLERS

The safe and easy OTC way to remove and install track rollers on HD-21 track roller assemblies. Use only two special tools—an OTC puller yoke and step plate adapter—with standard 50-ton Power-Twin hydraulic push-puller assembly.



PULLING D-9 FINAL DRIVE PINION FLANGE

Four OTC tools combine to hydraulically handle this otherwise difficult, time-consuming job: (A) push-puller, (B) push-puller legs, (C) male-female adapters, (D) 17½-ton ram and hydraulic pump assembly. One of many Caterpillar pulling jobs handled safely, and easily with special OTC tools.



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SERVICING MAINSHAFT OVERDRIVE GEAR IN MODEL B TOURNAPULL

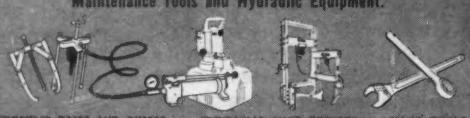
Remove and install the mainshaft overdrive gear in Fuller model L-1520 transmissions used in Model B Tournapulls safely and easily with special OTC "yoke" tool and hydraulic push-puller unit. A difficult job accomplished quickly and without damage to parts.

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PULLER AND PULLER SETS • HYDRAULIC RAMS AND PUMPS • HYDRAULIC SHOP PRESSES • HAND TOOLS

MAINTENANCE SHOP . . .

continued from page 229

should be placed on the inside position.

The condition of haul roads also affects tire life. Roads that are well designed and properly maintained may double or even triple haul speeds. Steep grades and sharp turns mean slippage and a shortened tire life. And loose or embedded rocks increase the chances of getting cuts in the tires.

Storage

Tires and tubes stored under the wrong conditions can age more quickly than those in daily service. Light, heat, oil, dust, dirt and moving air are responsible for deterioration. Here are some useful dos and don'ts of tire storage:

DO store tires in a cool, dry, dark area, that is protected from the wind. Cover tires with a tarpaulin if such an area is not available.

DO pile tires on a wood foundation to keep them off dirty, oily floors. Keep the same size tires together.

DON'T store tires in the same area with gasoline or lubricants. The rubber will absorb lubricant vapors and deteriorate rapidly.

DON'T place a large tire on a smaller one.

If tires are stored outside, protect them with a waterproof covering. It is essential to keep water and oil from the inside of the tire casing. A good way of doing this is to mount the tire on a spare wheel and to inflate it to 50% of operating pressure. The entire assembly then should be covered with a tarpaulin.

Here's another good thing to remember: There is a best time to buy tires to get longer tire life. The cooler a tire runs, the longer it will last. And tires that were bought in the fall and have run all winter have thinner treads and run cooler than new tires by the time summer comes around. New tires with heavier treads run hotter, wearing down about 30% faster.

A careful watch on overloading is a must. A 20% overload, for example, cuts expected tire life by 30%. The ratio continues, until at a 100% overload only 25% of normal tire life can be expected.

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60¢ per gal. with 60 hour drain
period = 60¢ actual cost.

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D-A's accurate laboratory service to
determine maximum safe drain periods.

Controlled lubrication means more hours of safe operation for each lubrication dollar. With D-A "Extra-Treated" Diesel Oil you can greatly extend your drain periods . . . up to 400% . . . and save on both oil costs and equipment maintenance. D-A "Extra-Treated" Diesel Oil offers these advantages: high, natural viscosity index for added protection against wear; more and better additives to prevent additive starvation and to hold harmful wastes in sus-

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SEPTEMBER, 1960

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You will find listed below the equipment contained in a complete paving spread. These machines are all in excellent condition and ready to go to work. We are disposing of this equipment due to the press of business in related fields of construction. All of this equipment meets state highway specifications.

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- 1—37 cu. yd. 11' dia. cement bin, cantilever, detachable columns 14'2", truck clearance 8'6". Wt. 8,742#.
- 1—Bin signal with adjustable support. Wt. 36#.

THE ABOVE LISTED EQUIPMENT COMBINES TO MAKE ONE COMPLETE BUTLER BATCH PLANT FOR PAVING OUTFIT.

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- 1—Schramm Electric Air Compressor.
- 1—Rex 31E Double Drum Paver with Diesel motor, ad-air attachment, automatic controls. S/N CD305.
- 1—Holtzel Finishing Machine S/N 56X126 18' 1" 26'.
- 1—Jackson Vibrator & Paving Tube S/N 85200 Model PT-202A.
- 1—Holtzel Mechanical Batching Machine S/N 56X137 18' to 26'.
- 1—Holtzel Bridge 18' to 26'.
- 2—Cleveland Form Tamers S/N 306X56 S/N 320X56.
- 1—Joint Applicator S/N 450 Model RJ-P.
- 1—Tar Kettle S/N 45-3366 Model AB-126.
- 1—Holtzel 10x10 paving forms.
- 1—Cement Car Vibrator.
- 2—Holtzel subgraders (tail blades) Adj. from 20 to 25 ft.
- 1—Cleveland subgrade scraper S/N 52X85.
- 1—Cleveland Form Grader S/N 236X56.
- 1—Tar kettle S/N 45-3366 Model AB-126.

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I—Koehring Longitudinal Finisher. 20 to 24 foot widths with transportation wheels having four 6'0" x 16 Pneumatic tires and towing bar. Rubber wheels for one side.

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- 1—Blaw Knox 3 cu. yd. mixer S/N 46-H3-287.
- 1—Butler Batch Plant Complete Stop Plant with one cement elevator—ideal for Ready Mix Plant—Fully automatic to meet highway specifications.
- 1—Jaeger Concrete Spreader Finisher. Model C9920.25. S/N 57785, with Quik Crown Change Screw with one complete set of extensions, set for 24" width, 25'32" crown incl. 4 part #30088-2 single hinged and 2 part. #30082-2 sans tread traction wheels installed with lifting lugs. Rubber wheel on one side.
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- 1—Caterpillar #12 Motor Grader S/N 872166.

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END DUMP EUCLIDS

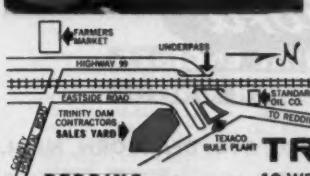


5—Model 46TD Euclid End Dump Units, 15 cu. yd., powered by Model NHRBIS Cummins Engines; 10—Model 63TD Euclid End Dump Units, 15 cu. yd., powered by Model 6-110 GMC Engines.

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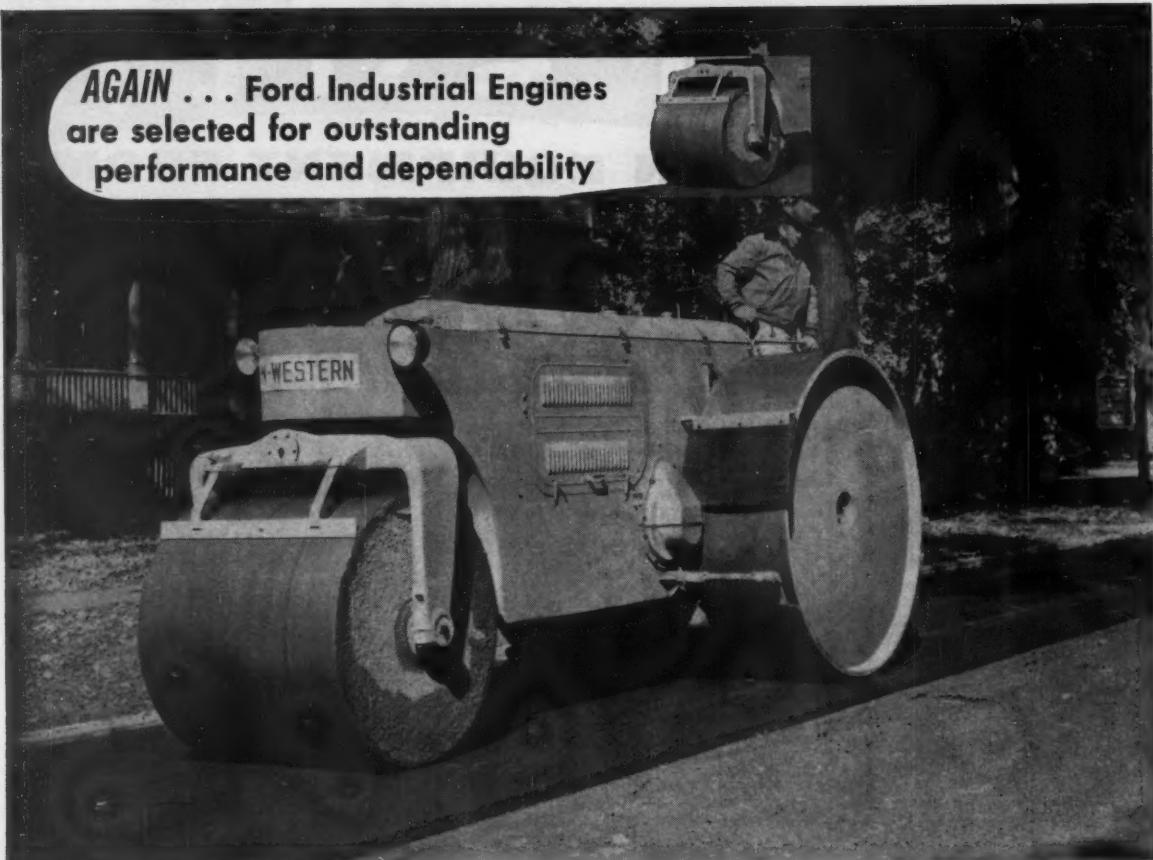
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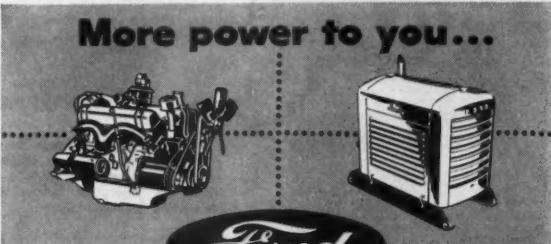
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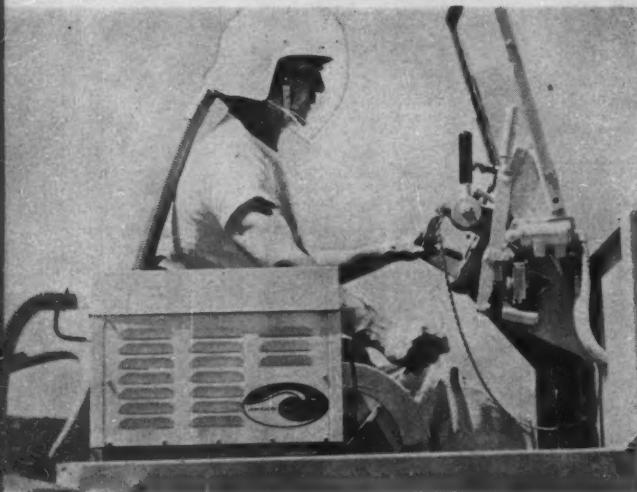
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Methods Memo . . .



Keeping a Cool Head

Here's an air conditioner that equipment operators can "wear" on the job. It consists of a fiber glass helmet and face plate connected to a portable, electrically powered refrigeration system with a blower. The system provides the operator with cool or warm filtered air over the head and shoulders. Jamieson Laboratories, Inc., of Santa Monica, Calif., developed the air conditioner. It can be mounted with simple brackets on any equipment and it runs on either 6 or 12-v current.

Waterproofing with Rust

Chemists at the West German firm of Staude & Lambach have developed a liquid compound that converts rust into a waterproof protective film. It can serve as an undercoat for all standard finishes. The rust converter can be applied with a brush or it can be sprayed on. Small components can be treated by dipping. The protective film obtained from rust by this process resists temperatures up to 400 deg F.

Transmission of the Future?

An idea of the past—the hydrostatic transmission—may become the reality of the near future. Currently there is considerable activity aimed at the development of a practical hydrostatic transmission for automotive type equipment. International Harvester is working on an experimental unit but has announced no plans to put it into production (CM&E, May, p. 266). And in England, Dowty Group, Ltd., has installed its hydrostatic transmission in wheel tractors. Construction equipment manufacturers are watching these developments closely.

Last month, the New York Air Brake Co., Waterbury, N.Y., announced development of a similar transmission, called Dynapower. They plan to make it available to equipment manufacturers in the near

future. Production of a fork lift truck equipped with Dynapower is slated for next year. The transmission also is being tested in construction and farm machinery.

The Dynapower transmission consists of a variable-displacement, axial-piston type hydraulic pump coupled directly to the vehicle's engine, and a fixed-displacement hydraulic motor driving into the differential. The differential can be eliminated by installing a separate hydraulic motor in each drive wheel.

Vehicle speed can be controlled by varying the engine speed or by changing the pump's displacement by a cam inside the pump. Either a lever or a foot pedal actuates the cam. Conventional brakes and gear shifts are eliminated. The transmission is capable of delivering maximum torque at any engine speed, including idling, and it is about 80% efficient.

Tool Makes Holes by Compacting

Pavement breaking, excavating, and resurfacing will no longer be necessary for laying small pipes, cables, and conduits under existing structures. A vibrating earth borer developed by Remington Arms Co. of Bridgeport, Conn., can make a 2-in.-dia hole without removing any earth. The tool contains a vibrating eccentric inside the head of a pointed steel borer. It vibrates at the rate of 10,000 vpm and compacts the earth around the perimeter of the hole. A 5-hp gasoline engine drives a flexible shaft that can push the borer through holes as long as 28 ft.

Contractor in a Bed of Oysters

In its efforts to aid Maryland's oyster business, the state's Tidewater Fisheries Commission has awarded a contract for "planting" millions of bushels of oysters in Chesapeake Bay. The construction company of C. J. Langenfelder and Son, Inc., of Baltimore will do the planting.

It'll cost the state just \$40,000 to cover only the cost of dredging. As compensation for the planting, the state will give \$180,000 worth of surplus shells to the contractor for use in making concrete block, as aggregate for asphalt and concrete, and for manufacture of chicken feed. Langenfelder has several wholly owned rock crushing and aggregate manufacturing subsidiaries.

Cold Is Better than Heat

Tests at the U.S. Army Chemical Corps Proving Ground, Dugway, Utah, show that intense cold is more effective and economical than heat in removing old asphalt floor tile. In the past, tile was heated with a blow torch and then scraped or pried loose. But when dry ice is applied instead, the mastic compound releases the tile in about 5 min, and it can be simply shoveled away.

Construction Methods

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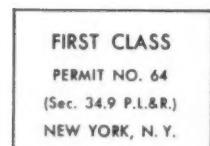
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